THE CHICAGO NUT MANUFACTURING COMPANY

CHICAGO, ILLINOIS

INTERNATIONAL

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Hex. Brass Nuts

Square Brass Nuts

Hex. Steel Nuts

Square Steel Nuts

S.A.E.&A.L.A.M. Steel Nuts

Semi Finished Steel Nuts

Semi Finished Brass Nuts

Brass Washers

Brass Wing Nuts

Steel Wing Nuts

Brass Cap Nuts

Knurled Brass Nuts

Chicago Binding Screws

Steel Taper Pins

Threaded Rods

Knurled Screws

Toggle Bolts

Expansion Bolts

Plumbers' Supplies

Machine Screws

Screw Machine & Special Work

Tables

THE CHICAGO NUT MANUFACTURING COMPANY

CATALOGUE
No. 15

Eastern Office and Warehouse
58 WARREN ST., NEW YORK

HOME OFFICE and FACTORY
2513 WEST CULLERTON ST.
CHICAGO

Hex. Brass Nuts
Square Brass Nuts
Hex. Steel Nuts
Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
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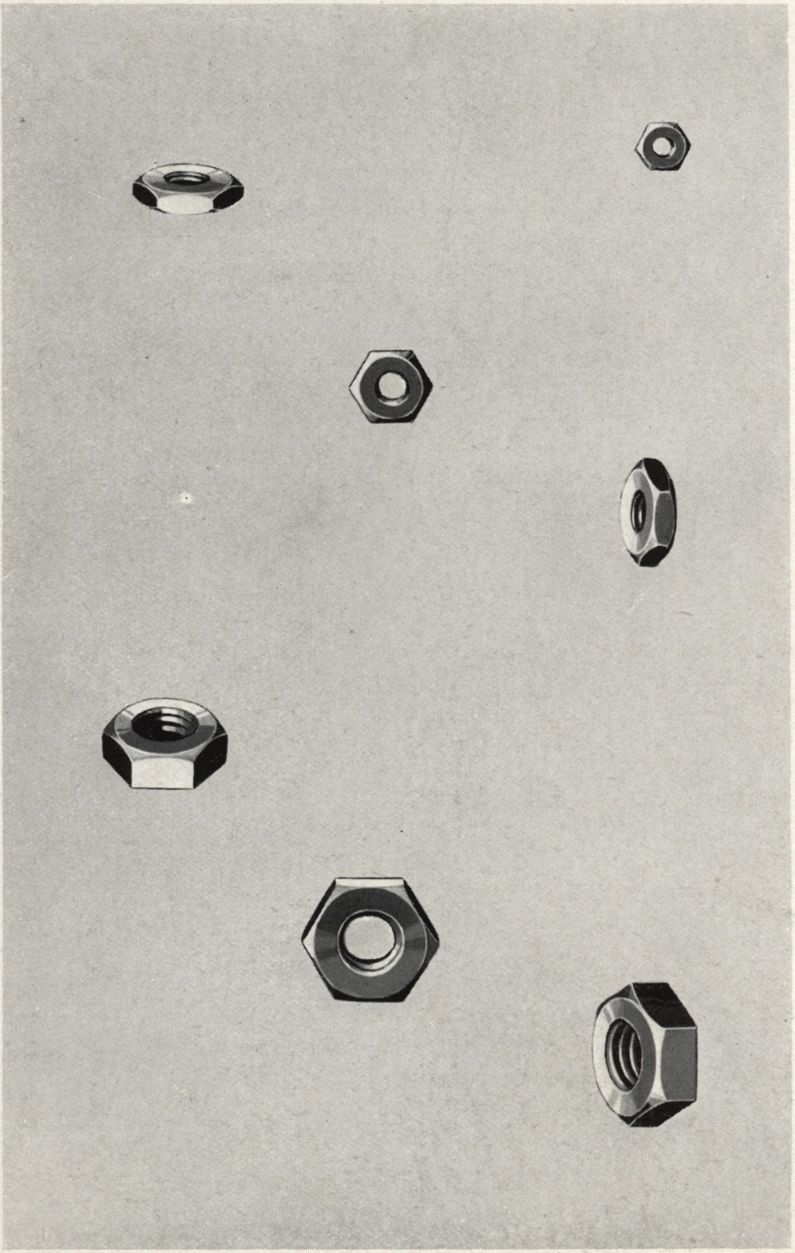


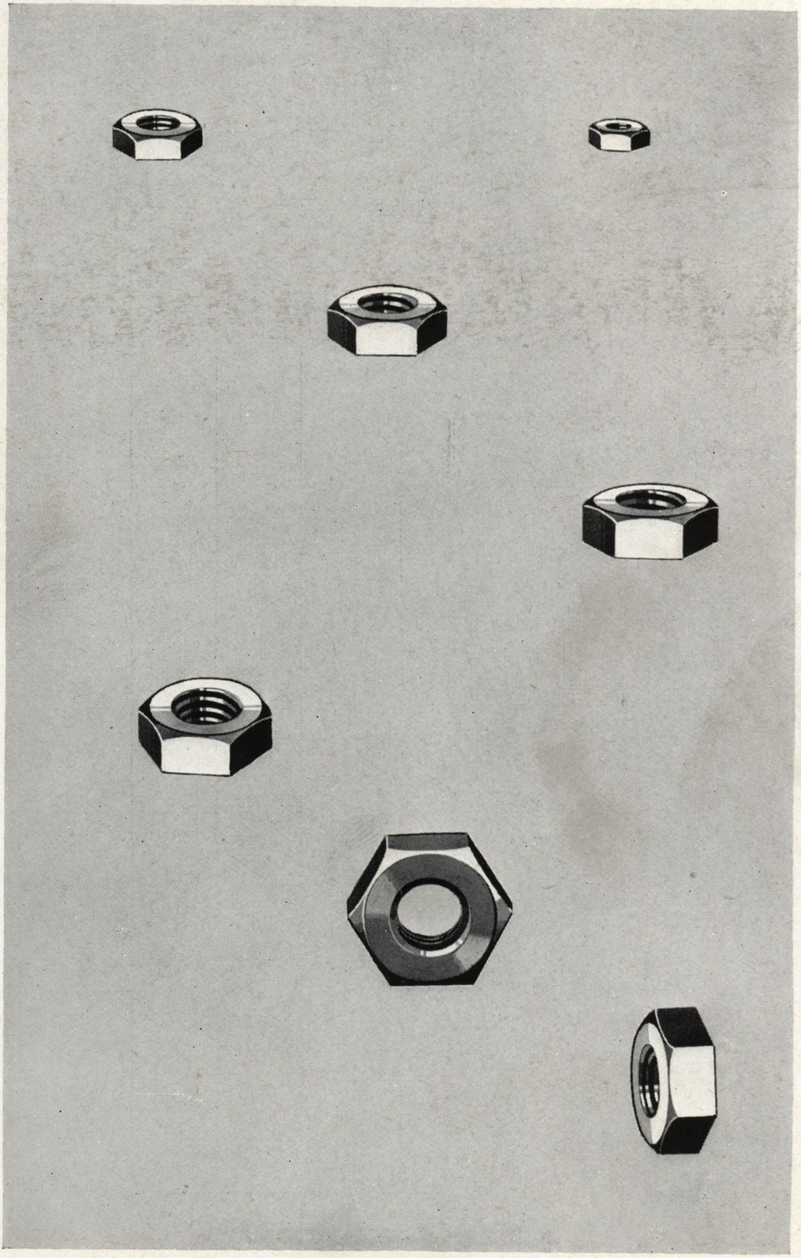
Brass Machine Screw Nuts Hexagon

Special List Adopted by THE CHICAGO NUT MFG. CO.

	SIZE OF THREAD (Carried in Stock)	Outside Diameter	THICKNESS		List Price Per 1,000
			Decimal of Inch	B. & S. Gauge	
DOUBLE CHAMFERED	2-56, 2-64, 3-48, 3-56, 4-32, 4-36	3/16	.064	14	$ 3.50
	4-32, 4-36, 4-40, 4-48, 5-40, 6-32, 8-32	1/4	.081	12	2.80
	5-40, 5-44, 6-32, 6-40, 8-32, 10-24, 10-32	5/16	.091	11	3.40
	6-32, 6-40, 8-32, 8-36, 10-24, 10-32	5/16	.114	9	3.80
	8-32, 8-36, 10-24, 10-32	3/8	.102	10	4.20
	5-40, 8-32, 8-36, 10-24, 10-32, 12-24, 12-28, 14-20, 14-24	3/8	.128	8	5.00
	12-24, 12-28, 14-20, 14-24, 1/4-20, 1/4-28	7/16	.114	9	5.60
	12-24, 12-28, 14-20, 14-24, 1/4-20, 1/4-28	7/16	.144	7	6.80
	14-20, 14-24, 1/4-20, 1/4-28, 16-18, 16-20	1/2	.128	8	7.20
	14-20, 14-24, 1/4-20, 1/4-28, 16-18	1/2	.162	6	9.00
SINGLE CHAMFERED	14-20, 14-24, 1/4-20, 1/4-28, 5/16-18	1/2	.181	5	10.80
	18-18, 5/16-18, 20-16, 20-18	9/16	.162	6	11.00
	18-18, 18-20, 5/16-18, 20-16, 20-18, 20-20	9/16	.218	7/32″	16.00
	5/16-18, 5/16-24, 20-18, 24-16, 3/8-16	5/8	.162	6	15.00
	5/16-18, 5/16-24, 20-18, 24-16, 3/8-16	5/8	.250	1/4″	22.40
	24-16, 3/8-16	11/16	.250	1/4″	26.40
	30-14, 7/16-14, 7/16-20	3/4	.250	1/4″	30.00

Special Sizes Made to Order in Quantities

Hex. Brass Nuts
Square Brass Nuts
Hex. Steel Nuts
Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
Steel Wing Nuts
Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



Brass

Machine Screw Nuts

Hexagon

Single Chamfered, Heavy Pattern

Standard or Hardware List—Adopted Aug. 15, 1921

Size	Standard Threads Carried in Stock	DIMENSIONS		List Price per 100	List Price per Gro.
		Outside Diameter	Thickness		
2	56, 64	3/16	1/16	$1.05	$1.51
3	48, 56	3/16	1/16	1.05	1.51
4	40, 48	1/4	3/32	.75	1.08
5	40, 44	5/16	7/64	.75	1.08
6	32, 40	5/16	7/64	.75	1.08
8	32, 36	11/32	1/8	.90	1.30
10	24, 32	3/8	1/8	1.20	1.73
12	24, 28	7/16	5/32	1.50	2.16
1/4	20, 28	1/2	3/16	1.95	2.81
5/16	18, 24	9/16	7/32	4.20	6.05
3/8	16, 24	5/8	1/4	5.70	8.21

SPECIAL SIZES CARRIED IN STOCK

4	32, 36	1/4	3/32	.75	1.08
10	30	3/8	1/8	1.20	1.73
14	20, 24	7/16	5/32	1.95	2.81
16	18	1/2	3/16	4.20	6.05
18	18, 20	9/16	7/32	4.20	6.05
20	16, 18, 20	9/16	7/32	4.20	6.05
24	16	5/8	1/4	5.70	8.21

Other Special Sizes Made to Order in Quantities

Square Brass Nuts
Hex. Steel Nuts
Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
Steel Wing Nuts
Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
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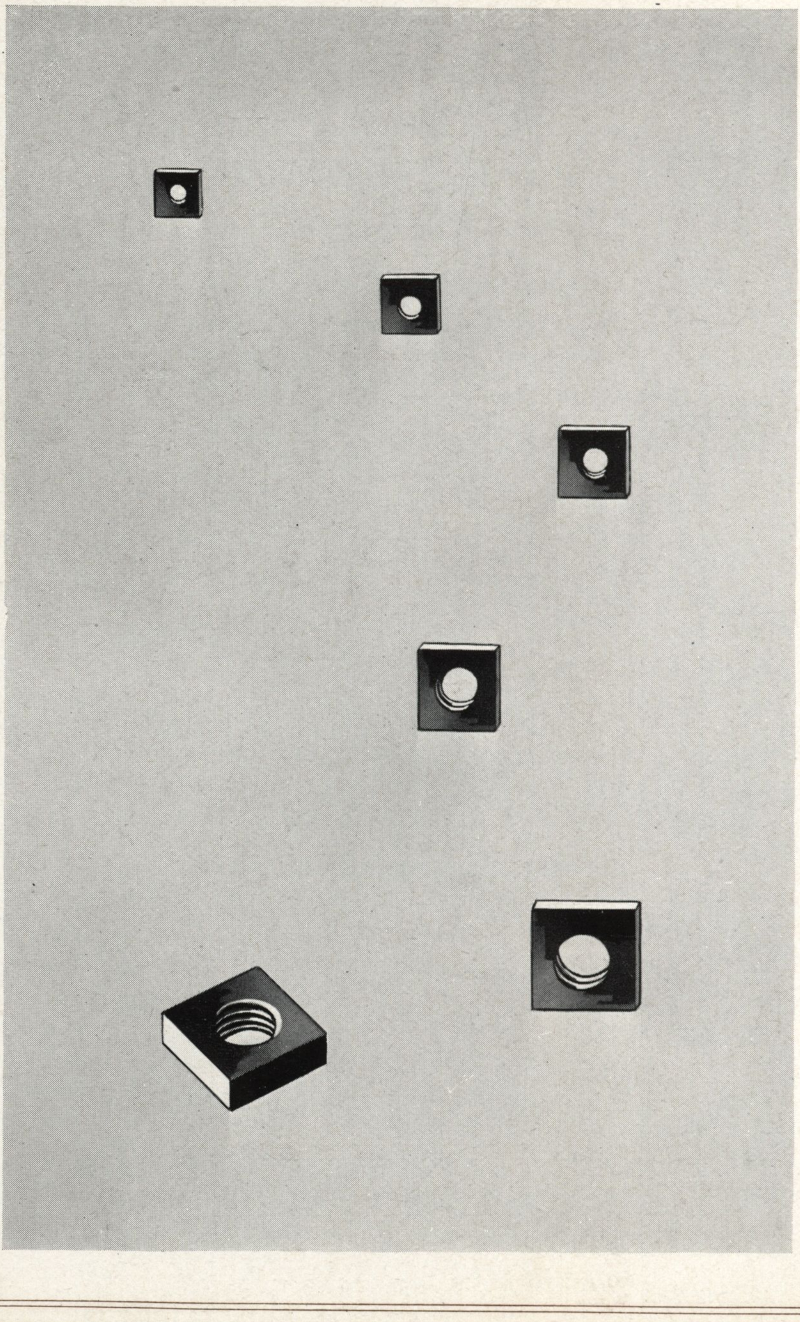

Brass
Machine Screw Nuts
Square

Standard List Adopted Aug. 15, 1921

Size	Standard Threads Carried in Stock	DIMENSIONS		List Price per 100	List Price per Gro.
		Outside Diameter	Thick-ness		
2	56, 64	3/16	1/16	$0.89	$1.28
3	48, 56	3/16	1/16	.89	1.28
4	40, 48	1/4	3/32	.64	.92
5	40, 44	5/16	7/64	.64	.92
6	32, 40	5/16	7/64	.64	.92
8	32, 36	11/32	1/8	.77	1.11
10	24, 32	3/8	1/8	1.02	1.47
12	24, 28	7/16	5/32	1.27	1.83
1/4	20, 28	1/2	3/16	1.66	2.39
5/16	18, 24	9/16	7/32	3.57	5.14
3/8	16, 24	5/8	1/4	4.85	6.98

SPECIAL SIZES CARRIED IN STOCK

4	32, 36	1/4	3/32	.64	.92
14	20, 24	7/16	5/32	1.66	2.39
16	18,	1/2	3/16	3.57	5.14
18	18,	9/16	7/32	3.57	5.14
20	16, 18	9/16	7/32	3.57	5.14
24	16,	5/8	1/4	4.85	6.98

Other Special Sizes Made to Order in Quantities

Square Brass Nuts
Hex. Steel Nuts
Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
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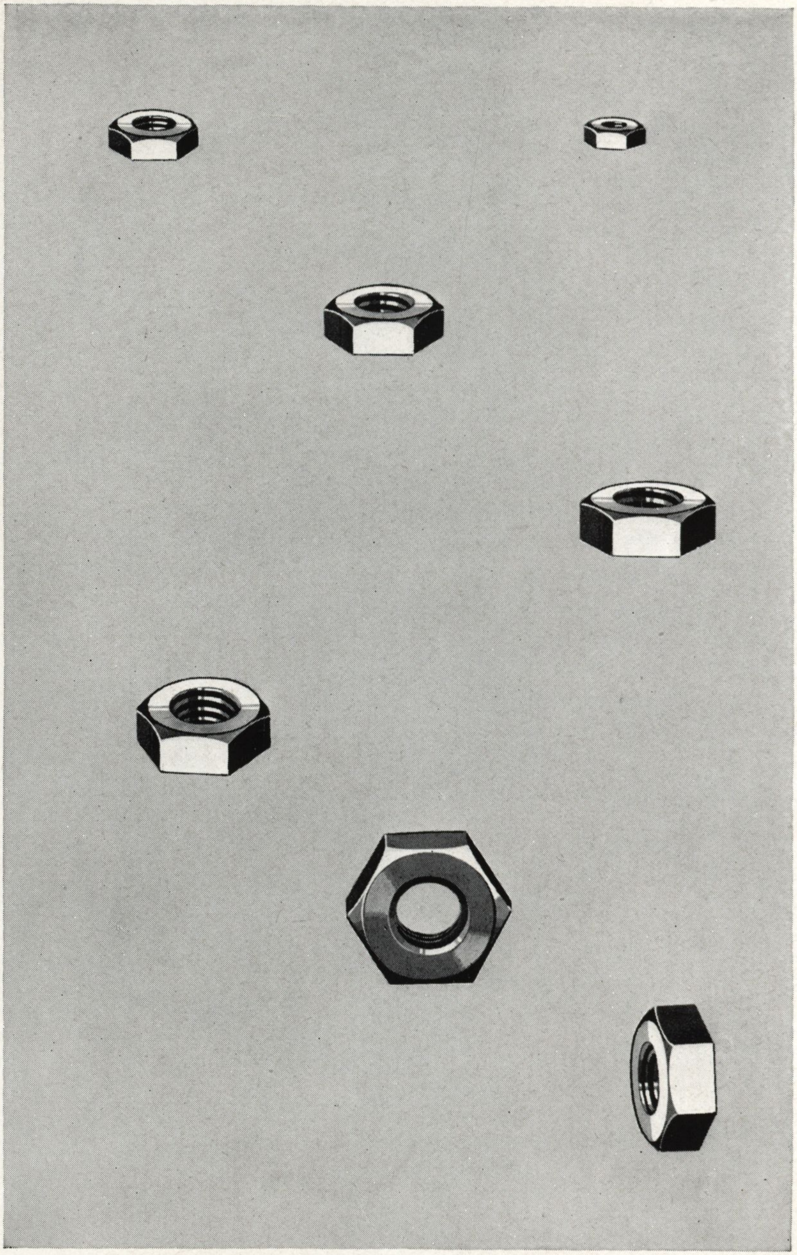

Steel
Machine Screw Nuts
Hexagon

Standard List Adopted Aug. 15, 1921

Size	Standard Threads Carried in Stock	DIMENSIONS		List Price per 100	List Price per Gro.
		Outside Diameter	Thickness		
2	56, 64	3/16	1/16	$0.35	$0.50
3	48, 56	3/16	1/16	.35	.50
4	40, 48	1/4	3/32	.25	.36
5	40, 44	5/16	7/64	.25	.36
6	32, 40	5/16	7/64	.25	.36
8	32, 36	11/32	1/8	.28	.40
10	24, 32	3/8	1/8	.30	.43
12	24, 28	7/16	5/32	.38	.55
1/4	20, 28	1/2	3/16	.50	.72
5/16	18, 24	9/16	7/32	.85	1.22
3/8	16, 24	5/8	1/4	1.10	1.58
7/16	14	25/32	9/32	1.60	2.30
1/2	13	7/8	5/16	2.30	3.31
SPECIAL SIZES CARRIED IN STOCK					
4	32, 36	1/4	3/32	.25	.36
6	36	5/16	7/64	.25	.36
8	32	5/16	1/8	.28	.40
10	30	3/8	1/8	.30	.43
12	32	3/8	1/8	.38	.55
14	20, 24	7/16	5/32	.50	.72
16	18, 20	1/2	3/16	.85	1.22
18	18	9/16	7/32	.85	1.22
20	16, 18	9/16	7/32	.85	1.22
24	16	5/8	1/4	1.10	1.58

Standard Iron Pipe Size Nuts Carried in Stock Tapped: 1/8″, 1/4″, 3/8″
Prices Quoted on Application.
Other Special Sizes Made to Order in Quantities

Hex. Steel Nuts
Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
Steel Wing Nuts
Brass Cap Nuts
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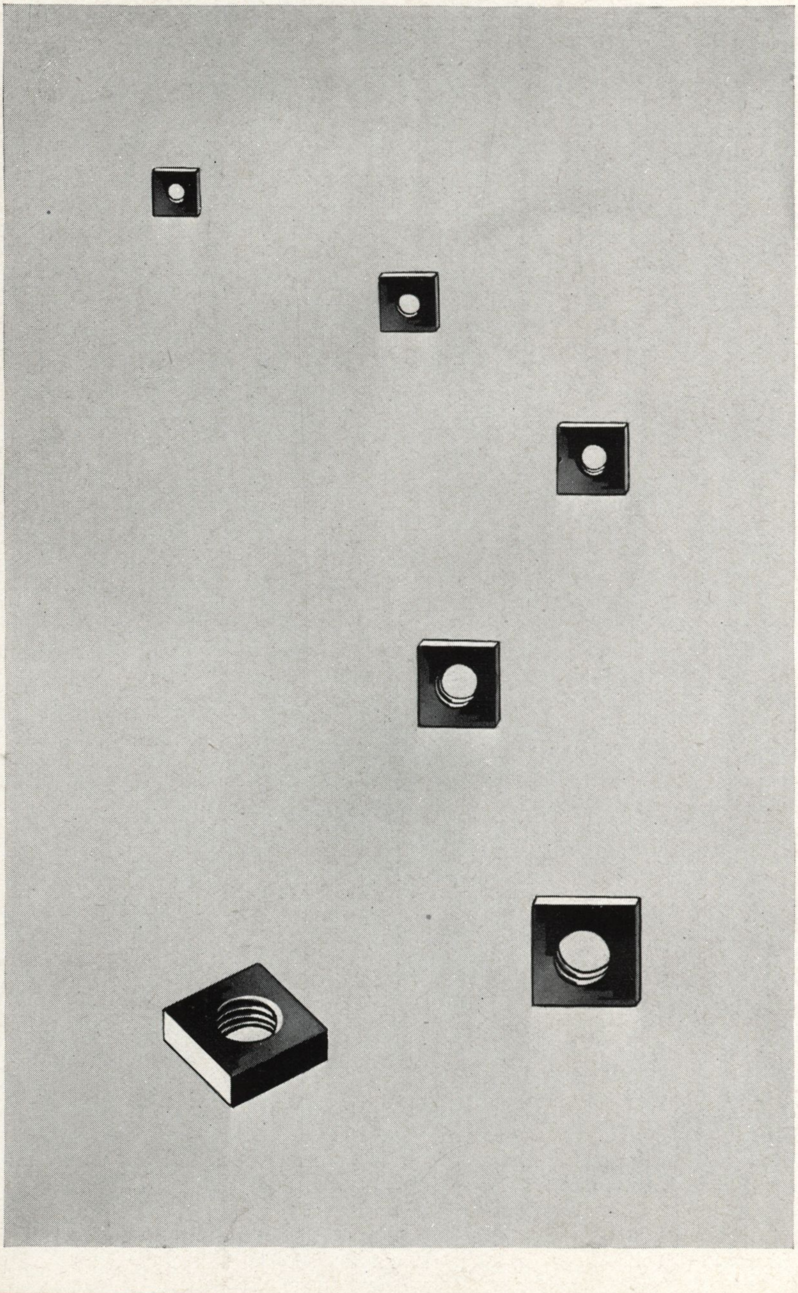

Steel
Machine Screw Nuts
Square

Standard List Adopted Aug. 15, 1921

Size	Standard Threads Carried in Stock	DIMENSIONS		List Price per 100	List Price per Gro.
		Outside Diameter	Thickness		
2	56, 64	3/16	1/16	$0.29	$0.42
3	48, 56	3/16	1/16	.29	.42
4	40, 48	1/4	3/32	.22	.31
5	40, 44	5/16	7/64	.22	.31
6	32, 40	5/16	7/64	.22	.31
5/32	28 (Stove Bolt)	11/32	1/8	.24	.35
8	32, 36	11/32	1/8	.24	.35
3/16	24 (Stove Bolt)	3/8	1/8	.26	.37
10	24, 32	3/8	1/8	.26	.37
12	24, 28	7/16	5/32	.32	.46
1/4	18 (Stove Bolt)	1/2	3/16	.43	.62
1/4	20, 28	1/2	3/16	.43	.62
5/16	18, 24	9/16	7/32	.72	1.04
3/8	16, 24	5/8	1/4	.94	1.35

SPECIAL SIZES CARRIED IN STOCK

4	32, 36	1/4	3/32	.22	.31
14	20, 24	7/16	5/32	.43	.62
16	18, 20	1/2	3/16	.72	1.04
18	18	9/16	7/32	.72	1.04
20	16, 18	9/16	7/32	.72	1.04
24	16	5/8	1/4	.94	1.35

Other Special Sizes Made to Order in Quantities

Square Steel Nuts
S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
Steel Wing Nuts
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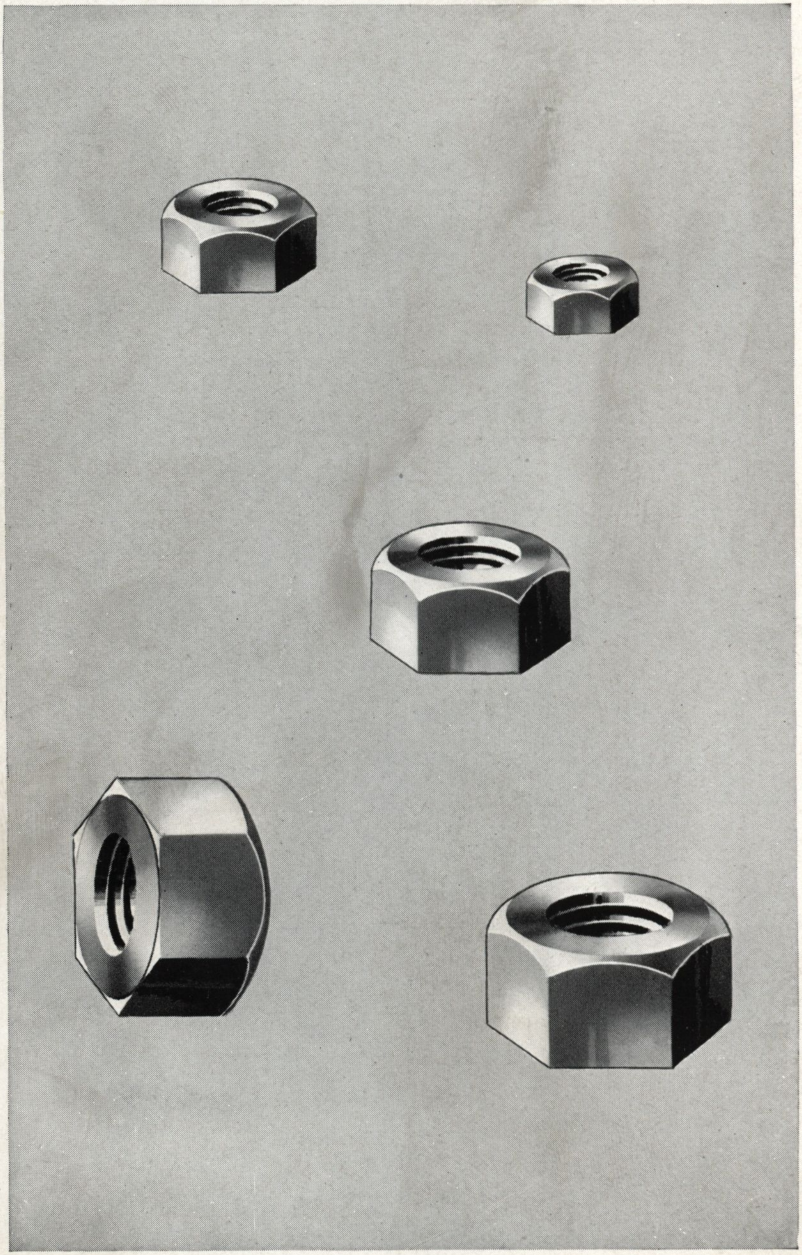

S. A. E. and A. L. A. M.
Plain Steel Nuts

SIZE (Carried in Stock)	Diameter	Thickness	List Price Per 100
1/4-28	(ALAM) 3/8	7/32	$2.00
1/4-28	(SAE) 7/16	7/32	2.00
5/16-24	1/2	17/64	2.50
3/8-24	9/16	21/64	3.25
7/16-20	(SAE) 5/8	3/8	3.75
1/2-20	3/4	7/16	4.50
9/16-18	7/8	31/64	5.50
5/8-18	15/16	35/64	6.50
3/4-16	(SAE) 1 1/16	21/32	8.50
7/8-14	1 1/4	49/64	12.00
1-14	1 7/16	7/8	17.50

Special Sizes Made to Order in Quantities

S.A.E.&A.L.A.M. Steel Nuts
Semi Finished Steel Nuts
Semi Finished Brass Nuts
Brass Washers
Brass Wing Nuts
Steel Wing Nuts
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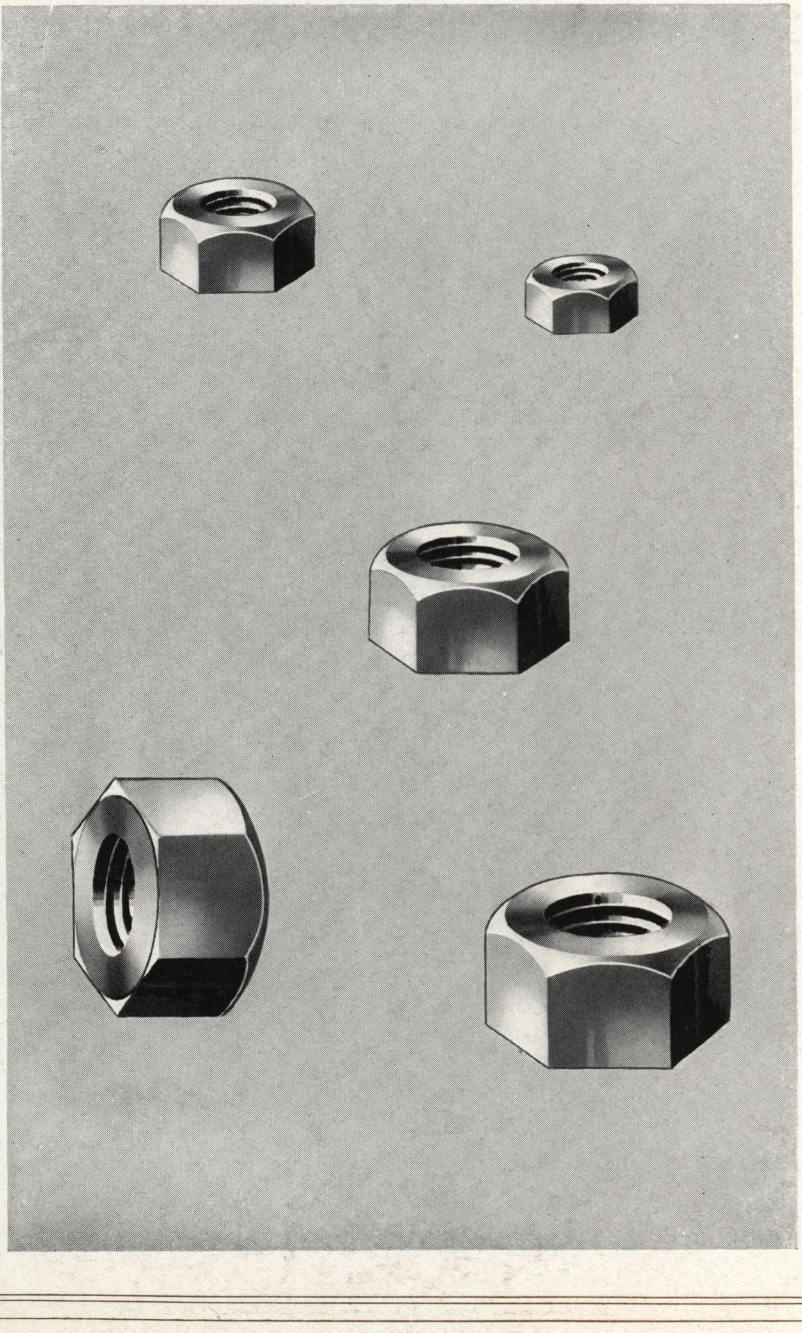

Steel
Semi-Finished Nuts
Hexagon

Full and Jam (or Check) Nuts

SIZE (Carried in Stock)	Diameter	THICKNESS		List Price Per 100
		Full Nut	Jam Nut	
3/16-24	3/8	3/16	. .	$2.00
1/4-20	1/2	1/4	3/16	2.00
5/16-18	19/32	5/16	7/32	2.50
3/8-16	11/16	3/8	1/4	3.25
7/16-14	25/32	7/16	9/32	3.75
1/2-12	7/8	1/2	5/16	4.50
1/2-13	7/8	1/2	5/16	4.50
9/16-12	31/32	9/16	11/32	5.50
5/8-11	1 1/16	5/8	3/8	6.50
3/4-10	1 1/4	3/4	7/16	8.50
7/8-9	1 7/16	7/8	1/2	12.00
1-8	1 5/8	1	9/16	17.50

Special Sizes Made to Order in Quantities

Semi Finished Steel Nuts
Semi Finished Brass Nuts
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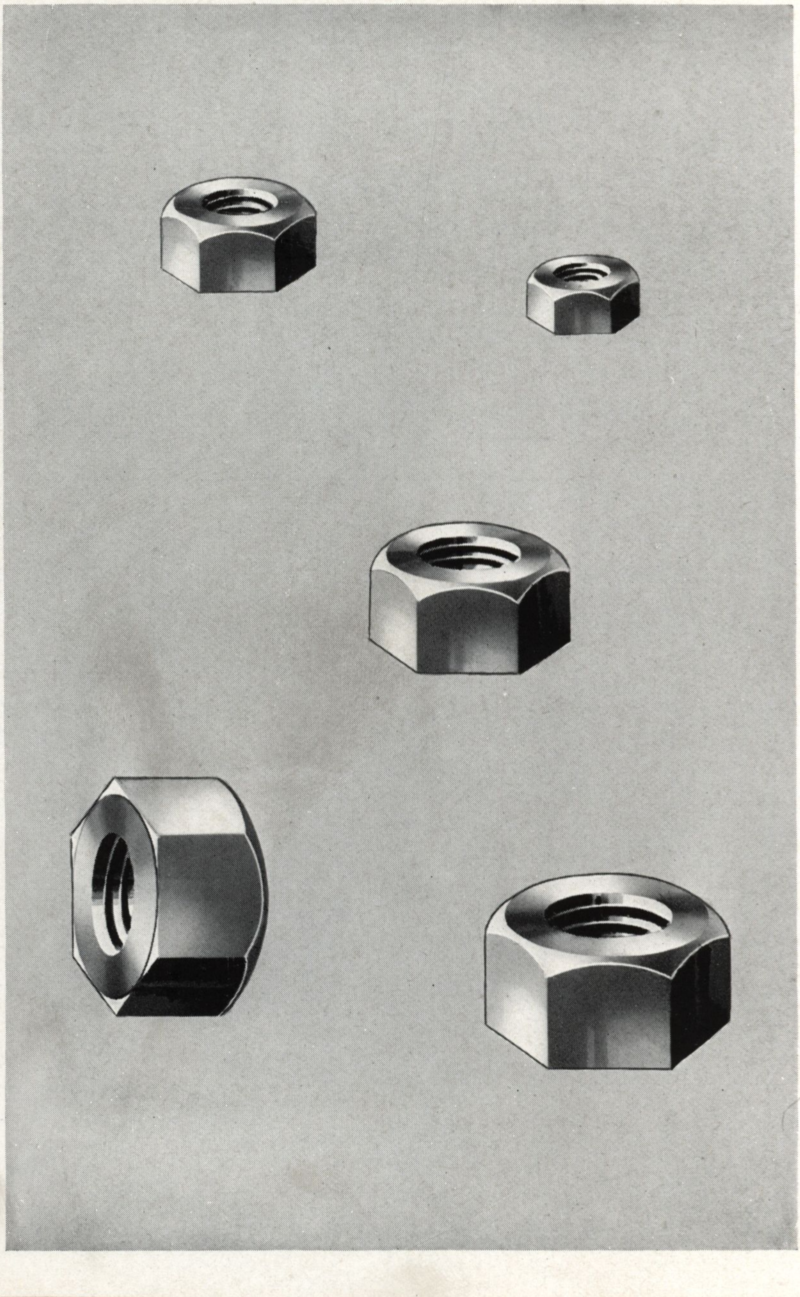

Brass
Semi-Finished Nuts
Hexagon

Full and Jam (or Check) Nuts

Milled from Hexagon Brass Rod

SIZE (Carried in Stock)	Diameter	THICKNESS		List Price Per 100
		Full Nut	Jam Nut	
3/16-24	3/8	3/16	..	$1.40
1/4-20	1/2	1/4	3/16	2.40
5/16-18	19/32	5/16	7/32	3.20
3/8-16	11/16	3/8	1/4	5.20
7/16-14	3/4	7/16	9/32	7.20
1/2-12	7/8	1/2	5/16	9.60
1/2-13	7/8	1/2	5/16	9.60
9/16-12	15/16	9/16	..	15.00
5/8-11	1 1/16	5/8	3/8	17.00
3/4-10	1 1/4	3/4	7/16	27.00
7/8-9	1 7/16	7/8	1/2	45.00
1-8	1 5/8	1	9/16	68.00

Special Sizes Made to Order in Quantities

Semi Finished Brass Nuts
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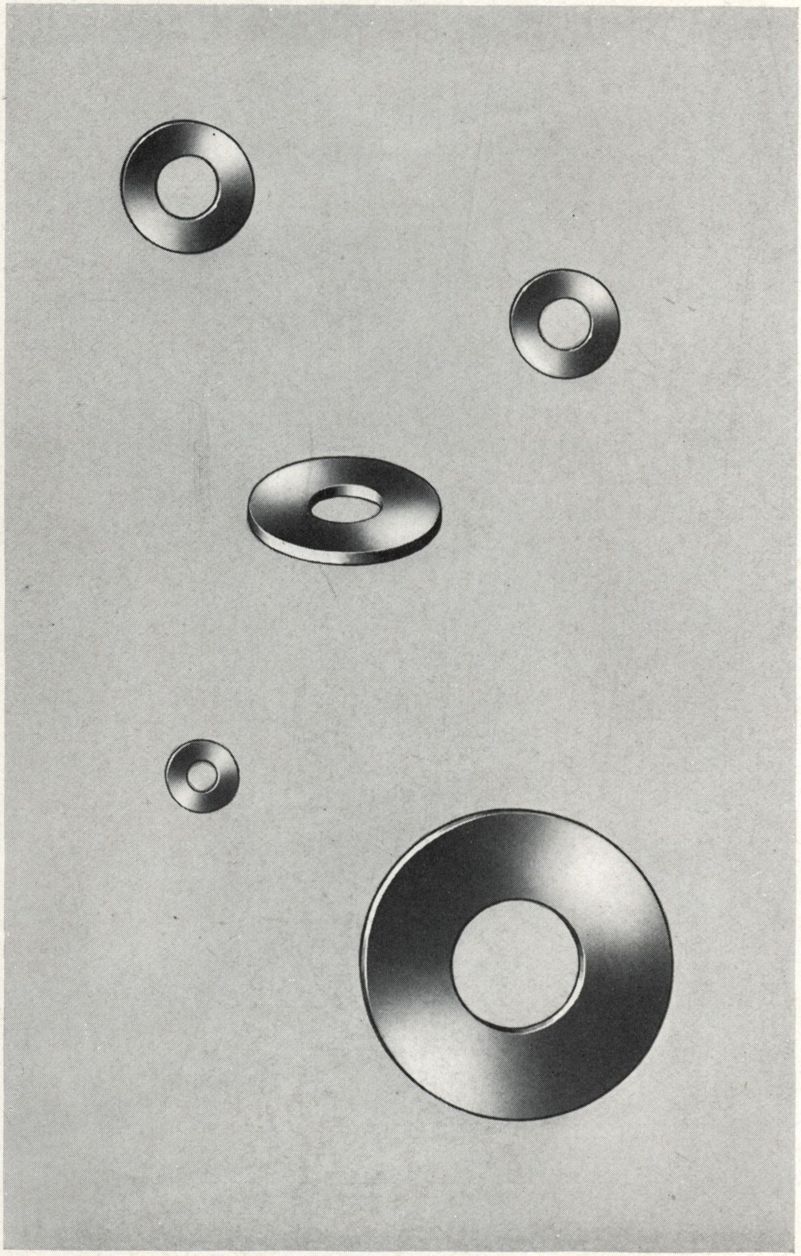

Brass Washers

The following Brass Washers are sizes which are made up to fit machine screws and bolts, and are regularly carried in stock by us. Special sizes made to order in lots of not less than 50 lbs.

Size of Machine Screw or Bolt	Outside Diameter	Inside Diameter	Thickness	List Price per Lb.	Approximate Number to the Pound
SMALL PATTERN					
No. 3	¼	.101	.020	$2.00	4000
No. 4	9/32	.125	.025	1.50	2500
No. 6	⅜	.150	.032	1.00	1100
No. 8	⅜	.170	.032	1.00	1170
No. 10	7/16	.195	.036	.90	760
No. 12	½	.228	.040	.80	525
No. 14	9/16	.260	.040	.80	420
No. 16	⅝	.285	.040	.75	340
No. 18	11/16	5/16	.051	.75	230
No. 20	¾	11/32	.064	.75	150
No. 24	⅞	.385	.064	.75	110
LARGE PATTERN					
No. 8	7/16	.170	.036	.90	725
No. 10	½	.195	.040	.80	480
No. 12	9/16	.228	.040	.80	380
No. 14	11/16	.260	.051	.75	210
No. 16	¾	.285	.064	.75	135
No. 18	⅞	5/16	.064	.75	100
No. 20	⅞	11/32	.064	.75	103
No. 24	1	.385	.081	.70	64
BOLT SIZES					
3/16	½	.195	.040	.80	480
¼	11/16	.260	.051	.75	210
5/16	⅞	11/32	.064	.75	103
⅜	1	.385	.081	.70	64
7/16	1 3/16	½	.081	.70	45
½	1⅜	9/16	.091	.70	29
⅝	1⅝	11/16	.091	.70	21
¾	2	13/16	.125	.70	10
⅞	2⅜	15/16	.144	.70	6
1	2½	1 1/16	.144	.70	5¾

Special Sizes Made to Order in Quantities of Not Less Than 50 Lbs.

Brass Washers
Brass Wing Nuts
Steel Wing Nuts
Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
Steel Taper Pins
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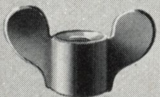
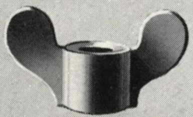
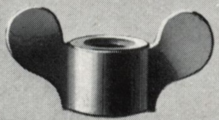


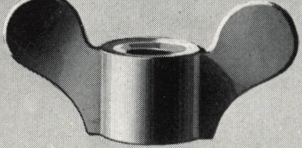
STYLE A



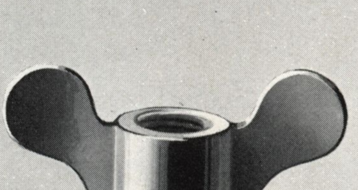
STYLE B



STYLE C



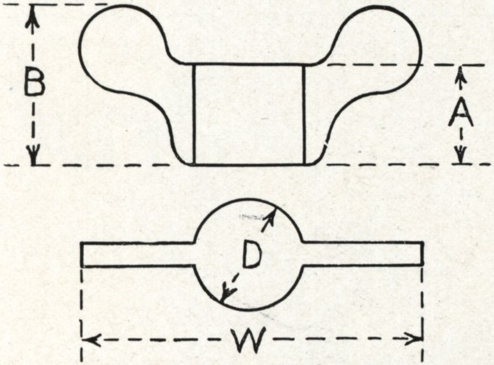
STYLE E



STYLE F

Brass Wing Nuts Pressed

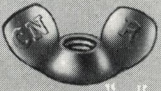
We manufacture pressed brass wing nuts of smooth finish and uniform dimensions, which present a far better appearance than the ordinary cast brass nuts. The smooth finish of this nut makes it especially suitable for nickel plating.



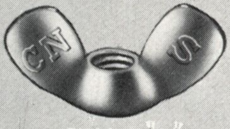
Size	SIZE OF THREAD (Carried in Stock)	DIMENSIONS				List Price Per 100
		A	B	D	W	
Style A	4-36, 4-40, 4-48, 5-40, 5-44, 6-32, 6-40, 8-32, 8-36	17/64	27/64	9/32	3/4	$1.50
Style B	10-24, 10-32	5/16	33/64	11/32	15/16	1.80
Style C	12-24, 12-28, 14-20, 14-24, 1/4-20, 1/4-28.	23/64	35/64	13/32	1 1/16	2.25
Style E	16-18, 18-18, 20-18, 5/16-18, 5/16-24	29/64	45/64	31/64	1 1/2	3.75
Style F	24-16, 3/8-16, 3/8-24, 7/16-14, 7/16-20	17/32	53/64	19/32	1 3/4	5.50

Special Sizes Made to Order in Quantities

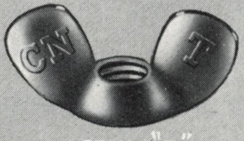
Brass Wing Nuts
Steel Wing Nuts
Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



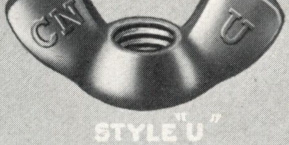
STYLE "R"



STYLE "S"



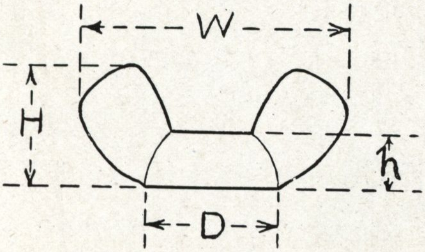
STYLE "T"



STYLE "U"

Steel
Wing Nuts
Pressed

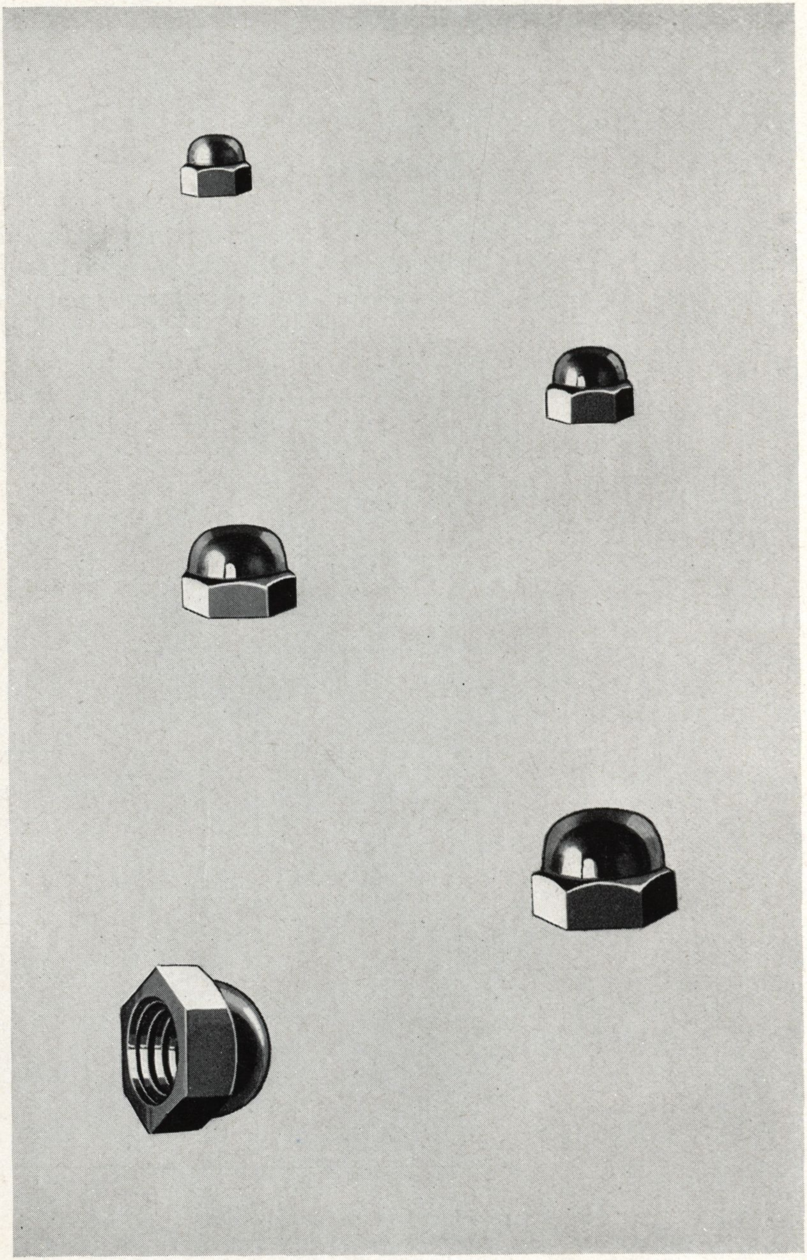
Our new line of steel wing nuts have the strength of drop forged nuts, and are as cheap as malleable nuts, with an appearance better than either. The smooth finish of this nut makes it especially suitable for nickel plating.



SIZE	SIZE OF THREAD (Carried in Stock)	DIMENSIONS				List Price Per 100
		W	H	D	h	
Style R	6-32, 6-40	13/16	3/8	13/32	11/64	$1.25
Style R	8-32, 8-36, 10-24, 10-32, 12-24, 12-28, 3/16-24	13/16	3/8	13/32	11/64	.90
Style S	14-20, 14-24, 16-18, 16-20, 1/4-20, 1/4-28	1 1/8	9/16	1/2	7/32	1.00
Style T	1/4-20, 20-16, 20-18, 5/16-18, 5/16-24	1 7/32	9/16	9/16	1/4	1.25
Style U	24-16, 3/8-16, 3/8-24	1 7/16	11/16	11/16	5/16	1.60

Special Sizes Made to Order in Quantities

Steel Wing Nuts
Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables

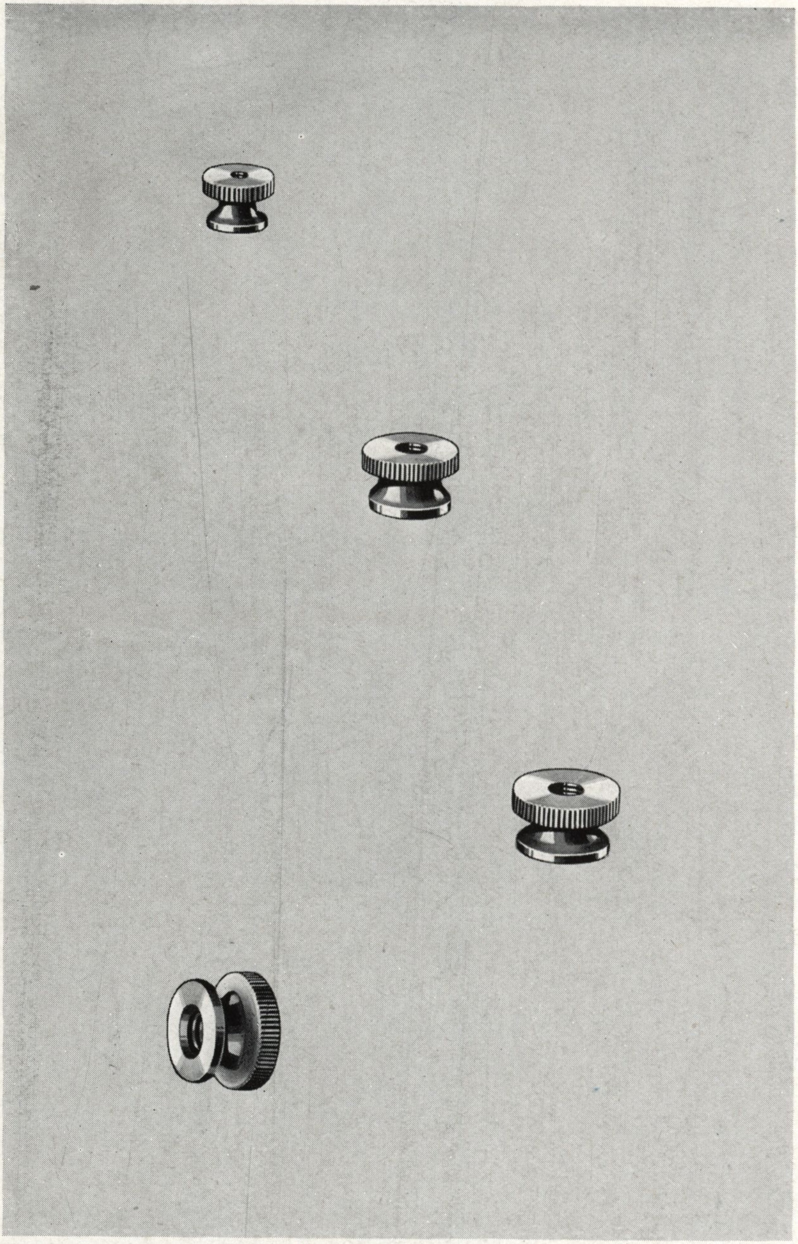


Brass
Cap Nuts
Hexagon

SIZE OF THREAD (Carried in Stock)	Diameter of Hexagon Base	Height	List Price Per 100
6-32, 8-32	5/16	9/32	$0.80
10-24, 10-32, 12-24	3/8	11/32	1.00
14-20, 14-24, 1/4-20	7/16	3/8	1.25
1/4-20, 16-18, 18-18	1/2	13/32	1.60
5/16-18, 20-18	9/16	7/16	2.00
24-16, 3/8-16, 3/8-24	5/8	1/2	2.80
7/16-14, 1/2-12, 1/2-13	3/4	9/16	4.50
5/8-11	15/16	3/4	15.00

Special Sizes Made to Order in Quantities

Brass Cap Nuts
Knurled Brass Nuts
Chicago Binding Screws
Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables

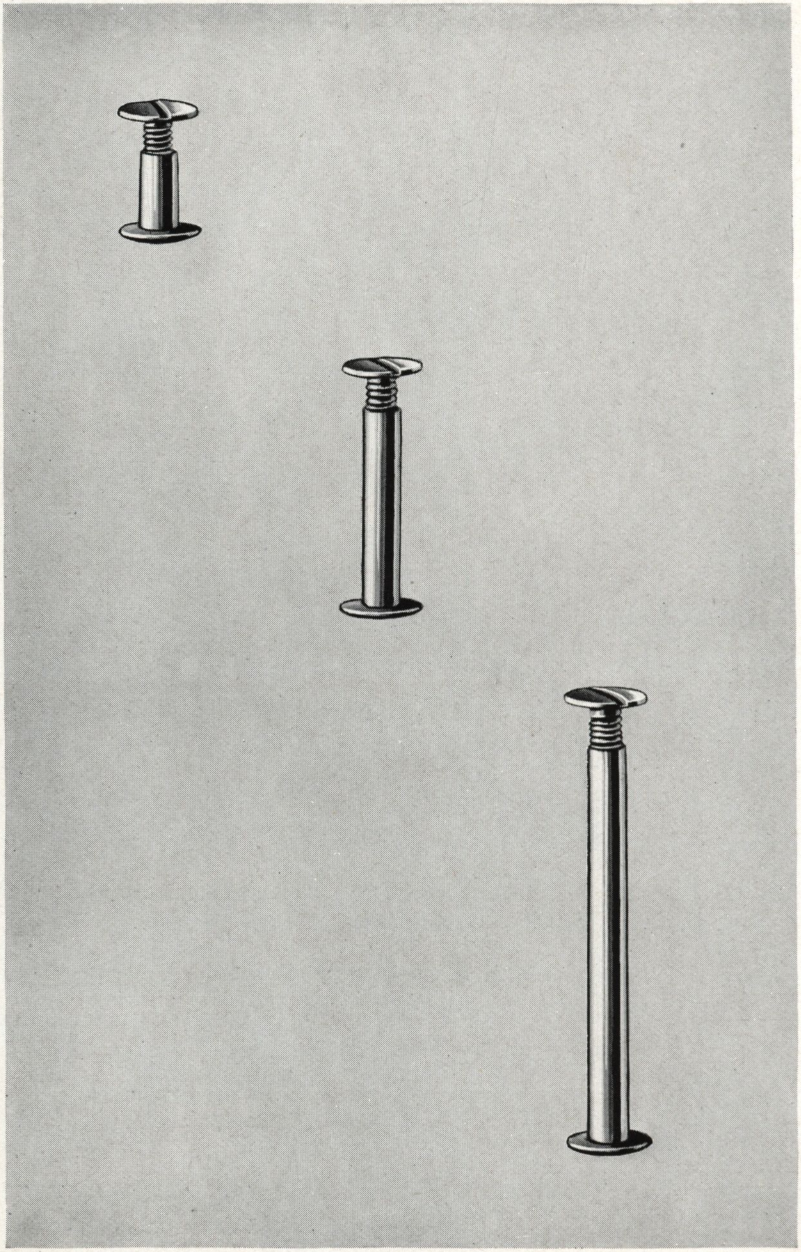


Brass
Knurled Nuts

SIZE OF THREAD (Carried in Stock)	Diameter of Head	Height	List Price Per 100
4-36	3/8	9/32	$1.20
6-32	13/32	9/32	1.20
*8-32 Small Pattern	23/64	15/64	.70
8-32 Large Pattern	7/16	5/16	1.30
10-24, 10-32	1/2	21/64	1.50
12-24	9/16	11/32	1.70
14-20	5/8	3/8	2.00

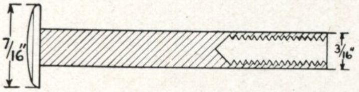
*8-32 small pattern is countersunk on bottom side and tapped slightly oversize for quick assembling, and is regularly used on dry cells or batteries.

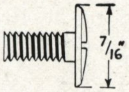
Special sizes made to order on quantities of 5,000 or over.



Chicago Binding Screws

Heads 7/16″ Diam. Body 3/16″ Diam. ¼″ Screws have Male Screws ¼″ Long. Screws ⅜″ and Longer have Male Screws ⅜″ Long.



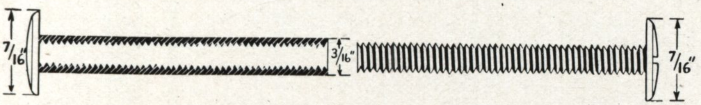


Made of Brass—Will Not Rust

Length Carried in Stock	List Price Per 100 Plain Brass	List Price Per 100 Nickel Plated	Length Carried in Stock	List Price Per 100 Plain Brass	List Price Per 100 Nickel Plated
¼″	$3.20	$4.20	1½″	$ 6.40	$ 7.40
⅜″	3.80	4.80	1¾″	6.80	7.80
½″	4.20	5.20	2″	9.00	10.00
⅝″	4.80	5.80	2½″	10.00	11.00
¾″	5.20	6.20	3″	11.00	12.00
1″	5.60	6.60	3½″	12.75	13.75
1¼″	6.00	7.00	4″	15.00	16.00

Full Expansion Chicago Binding Screws

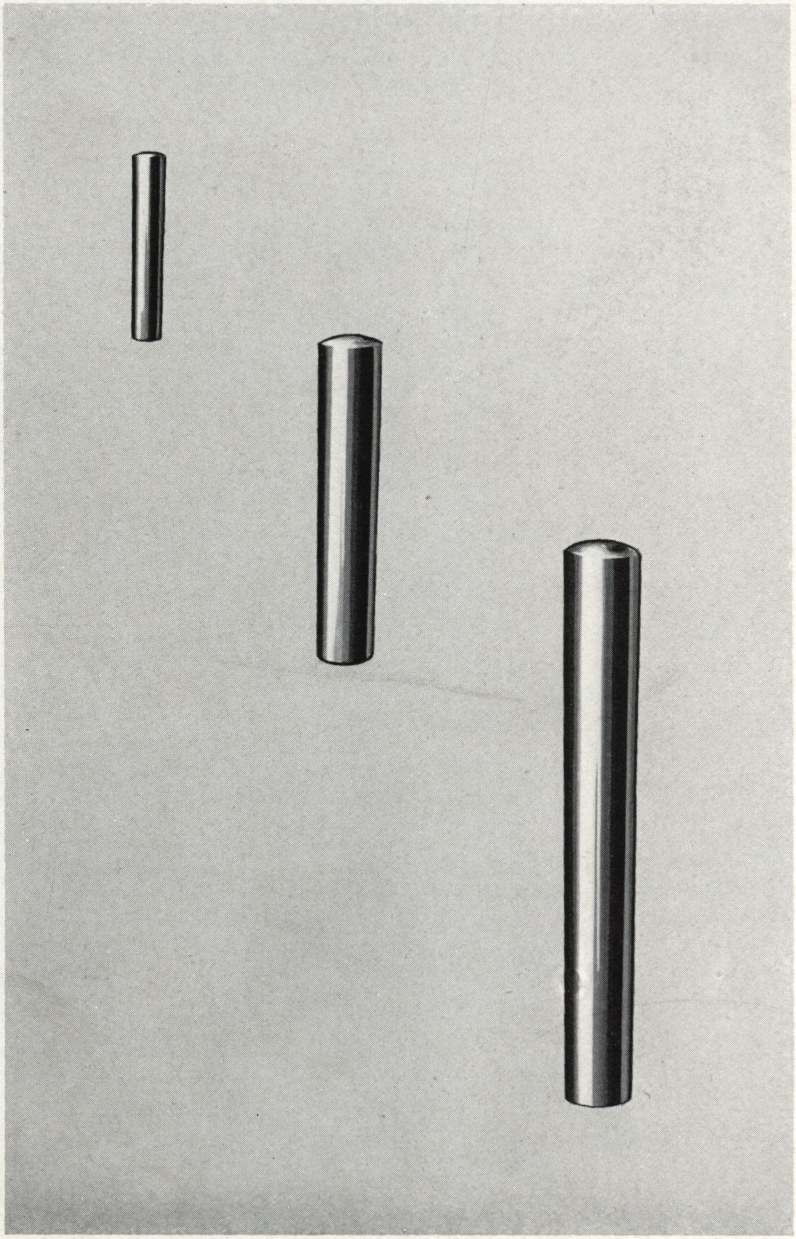
Full Expansion Screws Have Male Screw Same Length as Female Screw



Made of Brass—Will Not Rust

LENGTH (Carried in Stock)	List Price Per 100 Plain Brass	List Price Per 100 Nickel Plated
½″	$ 6.50	$ 7.50
⅝″	7.50	8.50
¾″	8.50	9.50
1″	9.50	10.50
1¼″	10.50	11.50

Chicago Binding Screws
Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



Steel
Taper Pins
Standard

Taper ¼″ to the foot

LIST PRICE CENTS PER 100

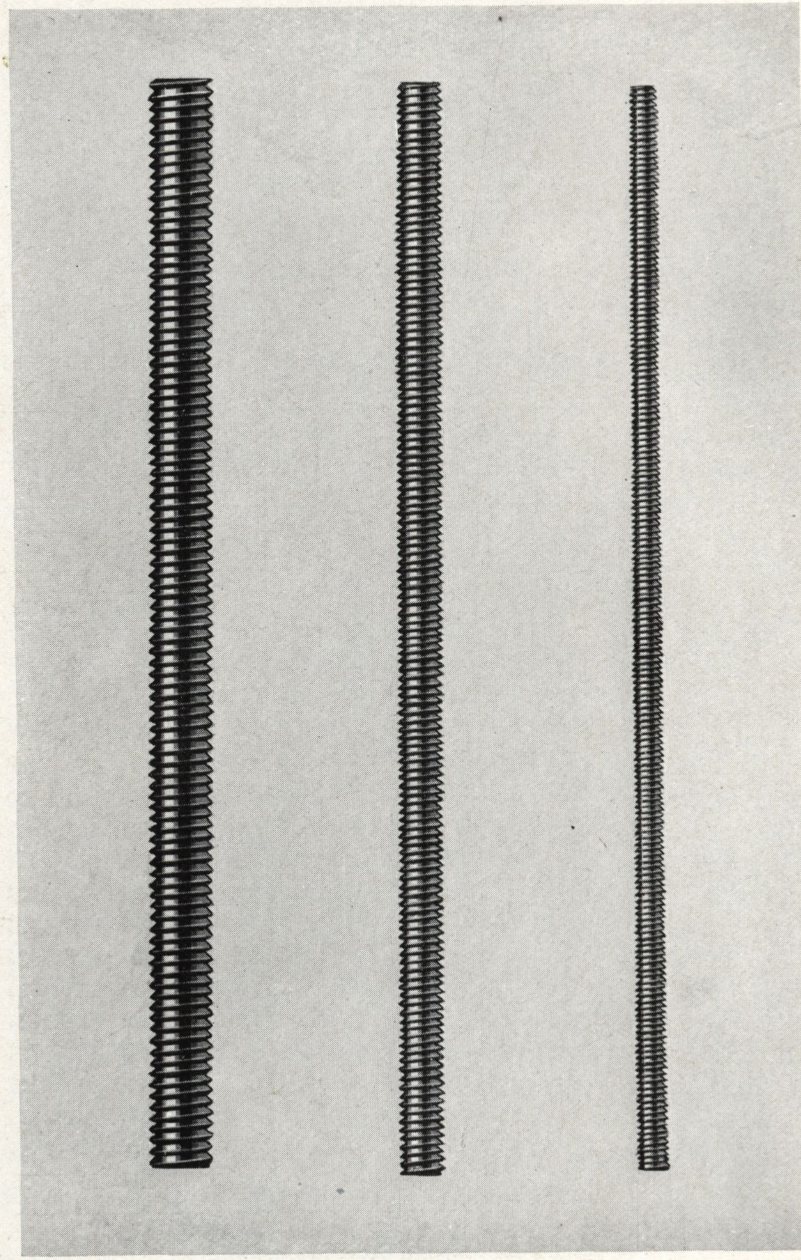
Diameter at Large End	.141	.156	.172	.193	.219	.250	.289	.341	.409	.492	.591	.706
Approximate Fractional Sizes	9/64	5/32	11/64	3/16	7/32	¼	19/64	11/32	13/32	½	19/32	23/32
Number	00	0	1	2	3	4	5	6	7	8	9	10
½	180	180	200									
¾	180	180	200	210	230	250	275	300				
1	205	205	225	235	255	275	300	325	375			
1¼	230	230	250	260	280	300	325	350	400	465		
1½	255	255	275	285	305	325	350	375	425	500	700	900
1¾		280	300	310	330	350	375	400	450	540	750	950
2		305	325	335	355	375	405	435	475	580	800	1000
2¼				360	380	400	440	475	525	625	860	1075
2½			375	385	405	425	475	520	575	675	920	1150
2¾				410	430	450	510	570	625	725	980	1225
3			425	435	455	475	545	625	675	780	1050	1325
3¼							580	675	725	840	1120	1425
3½					505	525	615	725	775	900	1190	1525
3¾								775	825	960	1260	1625
4							685	825	875	1020	1330	1725
4½									975	1140	1470	1925
5									1075	1260	1610	2125
5½										1380	1750	2325
6										1500	1890	2525

LARGE SIZES

SMALL SIZES

Special Sizes Made to Order in Quantities

Steel Taper Pins
Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



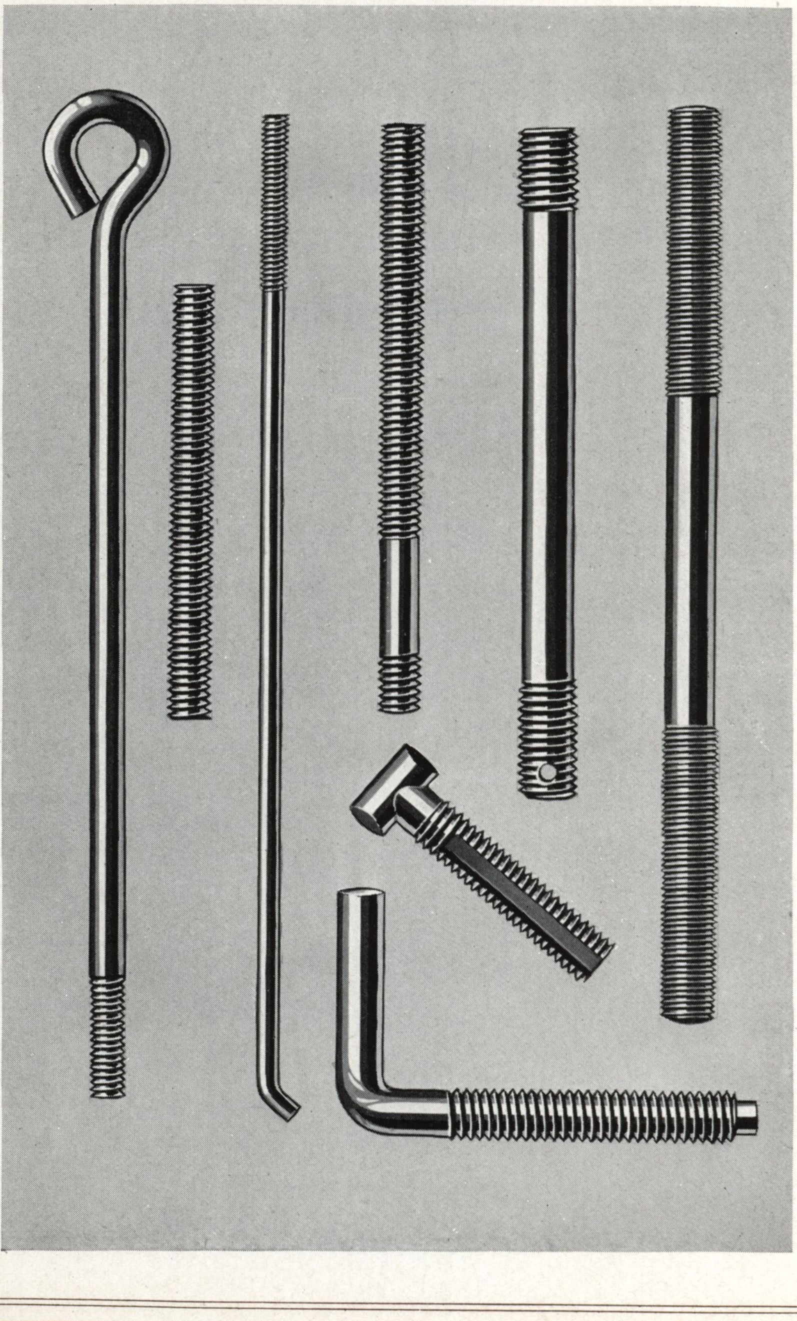
Brass and Steel Threaded Rods

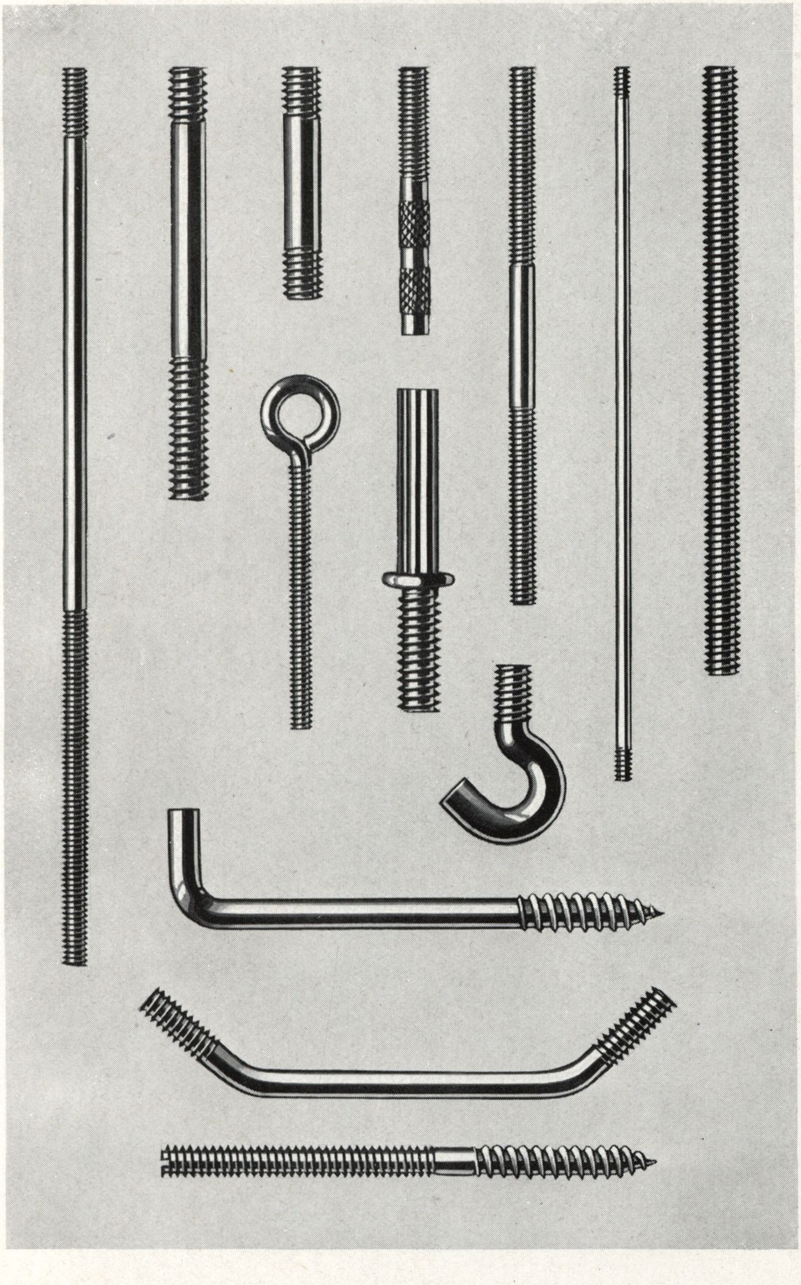
Continuous Thread

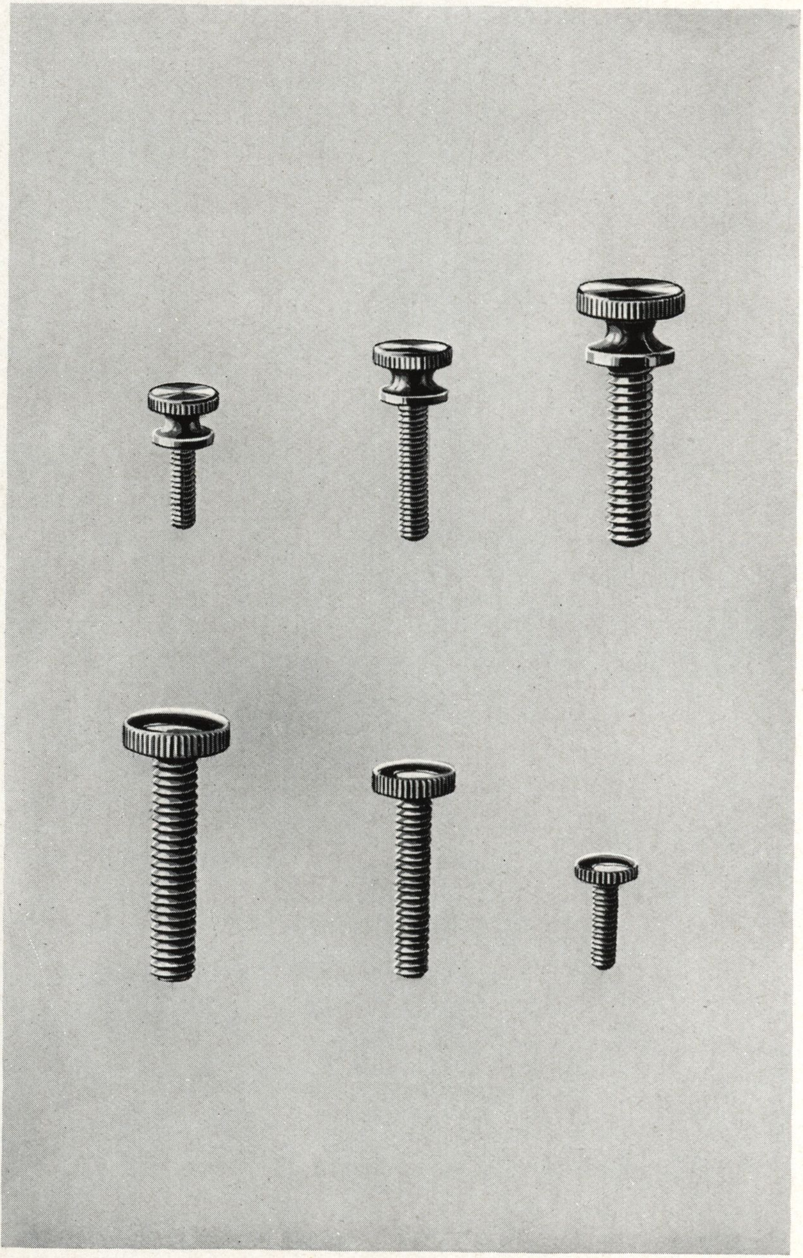
THREADS	Lengths Carried in Stock	List Price Per 100 Feet	
		STEEL	BRASS
6-32	1 foot	$3.50	$5.00
8-32	1 foot	3.75	5.50
10-32	1 foot	4.00	7.00
10-24	1 foot	4.00	7.00
12-24	2 feet	5.00	8.50
14-20	2 feet	6.00	10.00
14-24	2 feet	6.00	10.00
14-27	2 feet	6.00	10.00
¼-20	2 feet	6.00	10.00
5/16-18	2 feet	7.50	18.00

Special Sizes Made to Order in Quantities

Threaded Rods
Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables







Brass
Knurled Screws
Style No. 1

Carried in Stock

Size of Thread	Diameter of Head	LIST PRICE PER 100		
		½ Inch	¾ Inch	1 Inch
4-36	5/16	$1.50	$1.90	
6-32	3/8	1.75	2.10	$2.50
8-32	13/32	2.00	2.40	2.90
10-24	7/16	2.40	2.80	3.30
12-24	½	3.00	3.50	4.10
14-20	9/16	3.50	4.20	5.00

Special Sizes Made to Order in Quantities

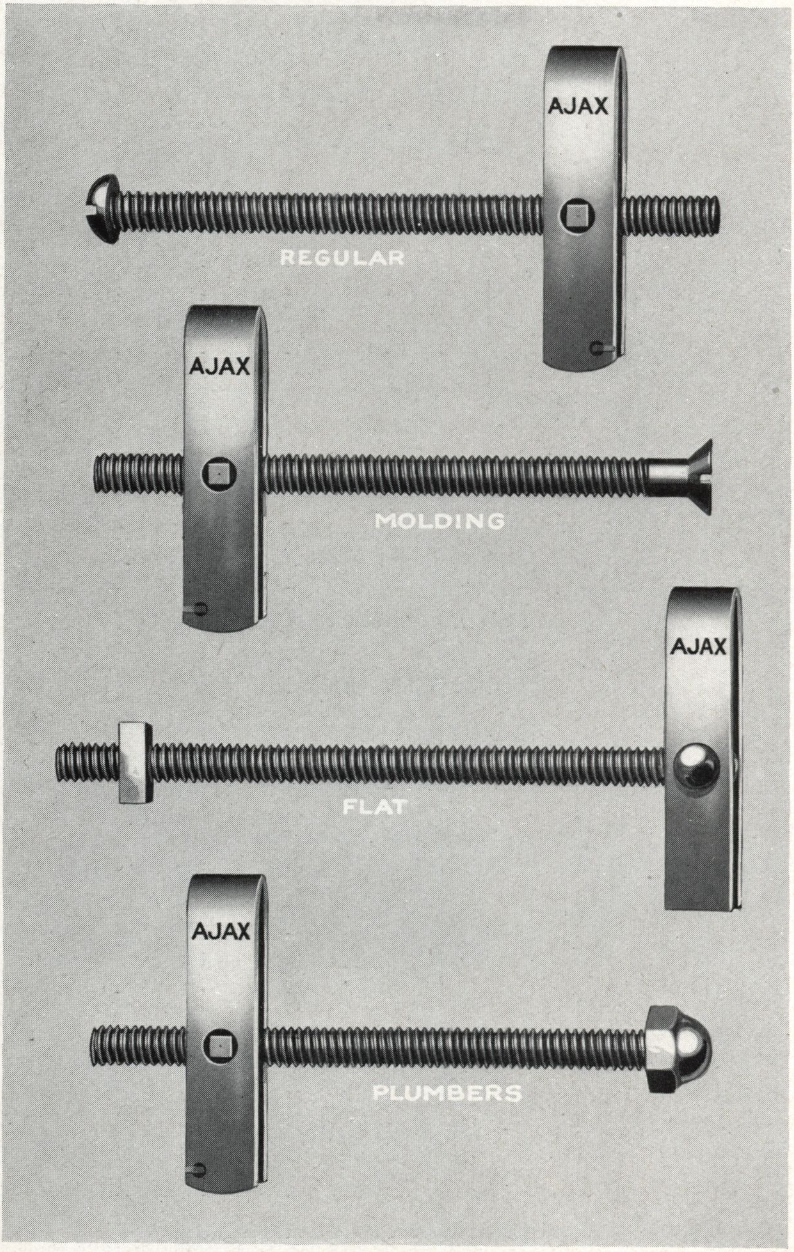
Steel and Brass
Knurled Screws
Style No. 2

Carried in Stock in Both Steel and Brass

Size of Thread	Diameter of Head	LIST PRICE PER 100			
		½ Inch	¾ Inch	1 Inch	1¼ Inch
6-32	11/32	$ .80	$ .90	$1.00	
8-32	13/32	.90	1.00	1.10	
10-24	7/16	1.00	1.10	1.25	$1.40
12-24	½	1.25	1.40	1.55	1.70
14-20	9/16	1.40	1.60	1.80	2.00

Special Sizes Made to Order in Quantities

Knurled Screws
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables

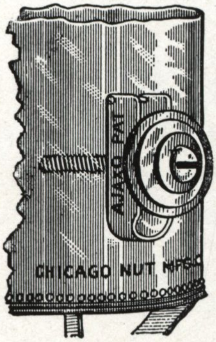

AJAX
REGULAR
AJAX
MOLDING
AJAX
FLAT
AJAX
PLUMBERS

Ajax
Toggle Bolts

Packed in Cartons of 50 Each

Size	STYLE AND LIST PRICE PER 100			
	Regular	Molding	Flat	Plumbers
*1/8x3 N.P.	$5.00			
*1/8x4 N.P.	5.40			
1/8x3 Plain	3.40	$3.40		
1/8x4 "	3.80	3.80		
3/16x3 "	3.60	3.60	$3.20	$6.60
3/16x4 "	4.00	4.00	3.40	7.00
3/16x6 "	4.80	4.80	3.80	7.80
1/4x3 "	4.00	4.00	4.00	8.00
1/4x4 "	4.40	4.40	4.40	8.40
1/4x6 "	5.20	5.20	5.20	9.20

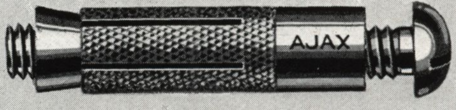
*Nickel Plated, used For Bathroom Fixtures.



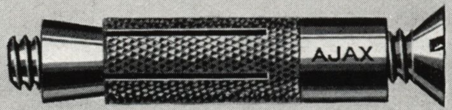
Ajax Boiler Repairs

LIST PRICE PER DOZEN, $2.50

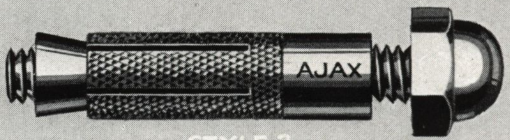
Toggle Bolts
Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



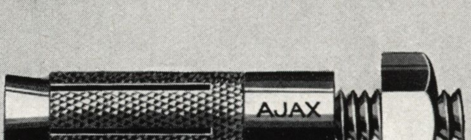
STYLE 1



STYLE 2



STYLE 3



STYLE 4

Ajax
Expansion Bolts
Styles 1 and 2

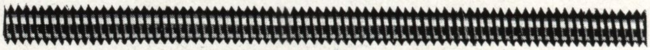
Packed in cartons of 100 each

Machine Screw Thread	8-32	10-24	14-20
Length of Bolt	LIST PRICE PER 100		
	⅛	3/16	¼
1	$5.50	$ 6.00	$ 9.00
1¼	6.00	6.50	9.50
1½	6.50	7.00	10.00
2	7.50	8.00	11.50
2½		10.00	13.50
3		12.50	16.00
4			24.00

Shields Only. With Nuts.

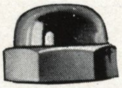
Length of Shield	Outside Diameter of Shield		
	5/16	5/16	⅜
	LIST PRICE PER 100		
⅞	$4.50	$4.50	$6.50
1¼	5.50	5.50	7.50

Expansion Bolts
Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



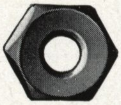
¼-20 THREADED BRASS ROD

Carried in Stock in 2-foot lengths



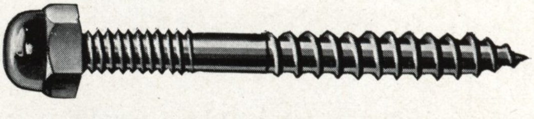
NICKEL PLATED CAP NUTS

Tapped ¼-20 to fit above rod. Carried in stock



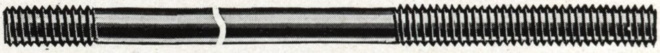
ROUGH ¼-20 HEXAGON BRASS NUTS

Used on back of marble work where they do not show. Carried in stock



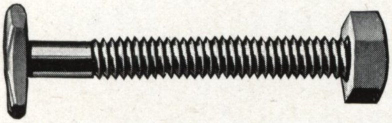
CLOSET SCREWS WITH N. P. LOOSE HEAD

Machine screw thread extra long so that top may be cut off if screw strikes nail in the floor. Carried in stock in solid brass or iron

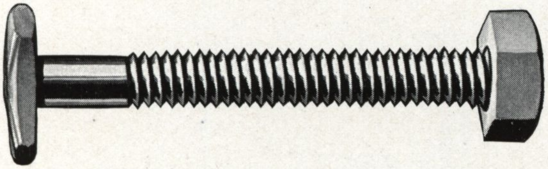


BRASS FLOAT RODS

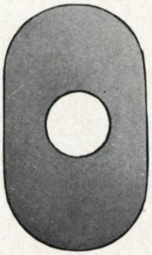
Made to order only



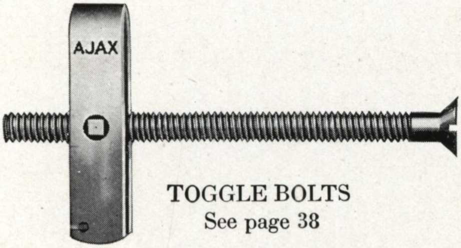
¼″ BRASS CLOSET BOLT WITH N. P. OPEN NUT
Carried in stock 1¾″ long



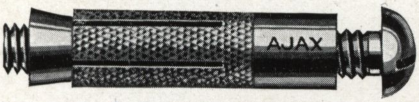
5/16″ BRASS CLOSET BOLT WITH N. P. OPEN NUT
Carried in stock 1¾″ and 2½″ long



N. P. OVAL BRASS WASHERS
To fit Closet Screw and Bolt. Carried in stock

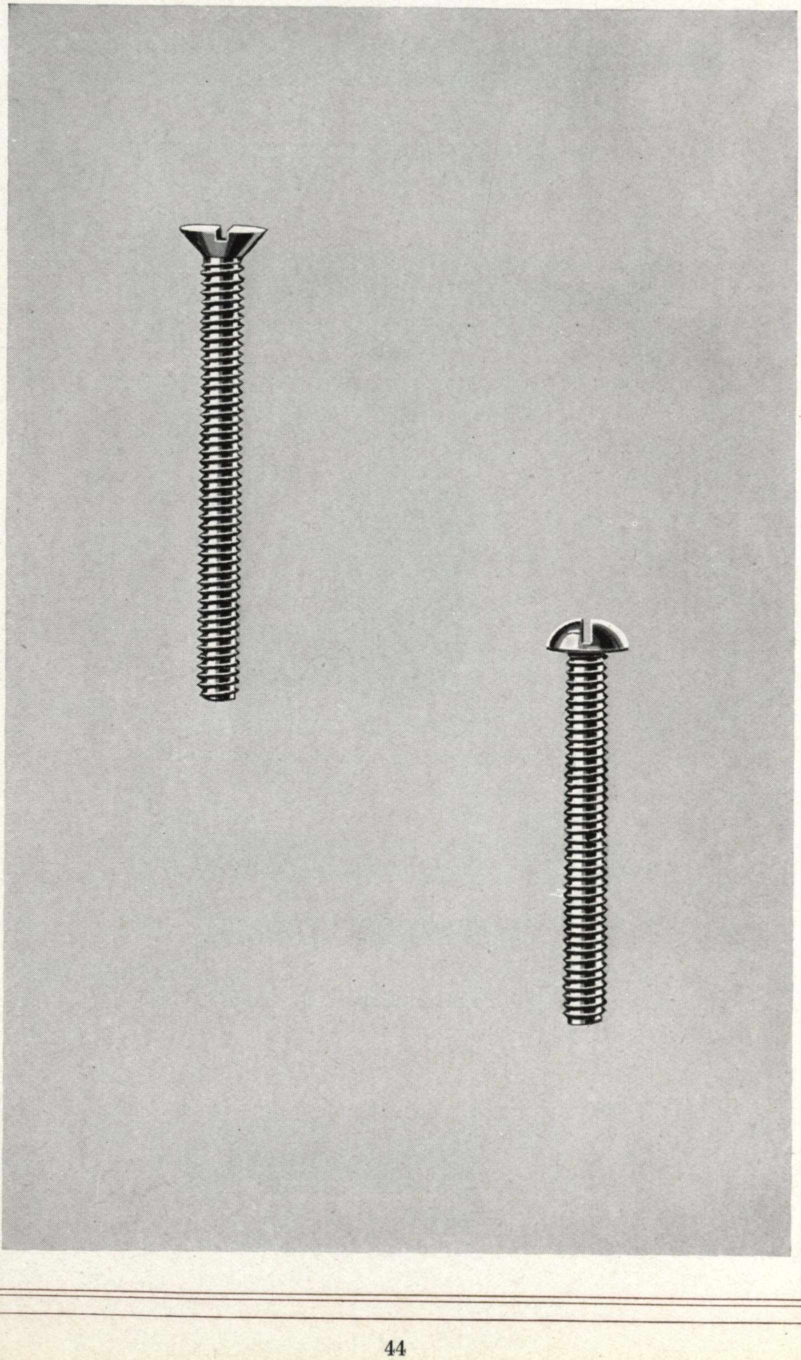


TOGGLE BOLTS
See page 38



EXPANSION BOLTS
See page 40

Plumbers' Supplies
Machine Screws
Screw Machine & Special Work
Tables



Steel
Machine Screws

List of June 15, 1921

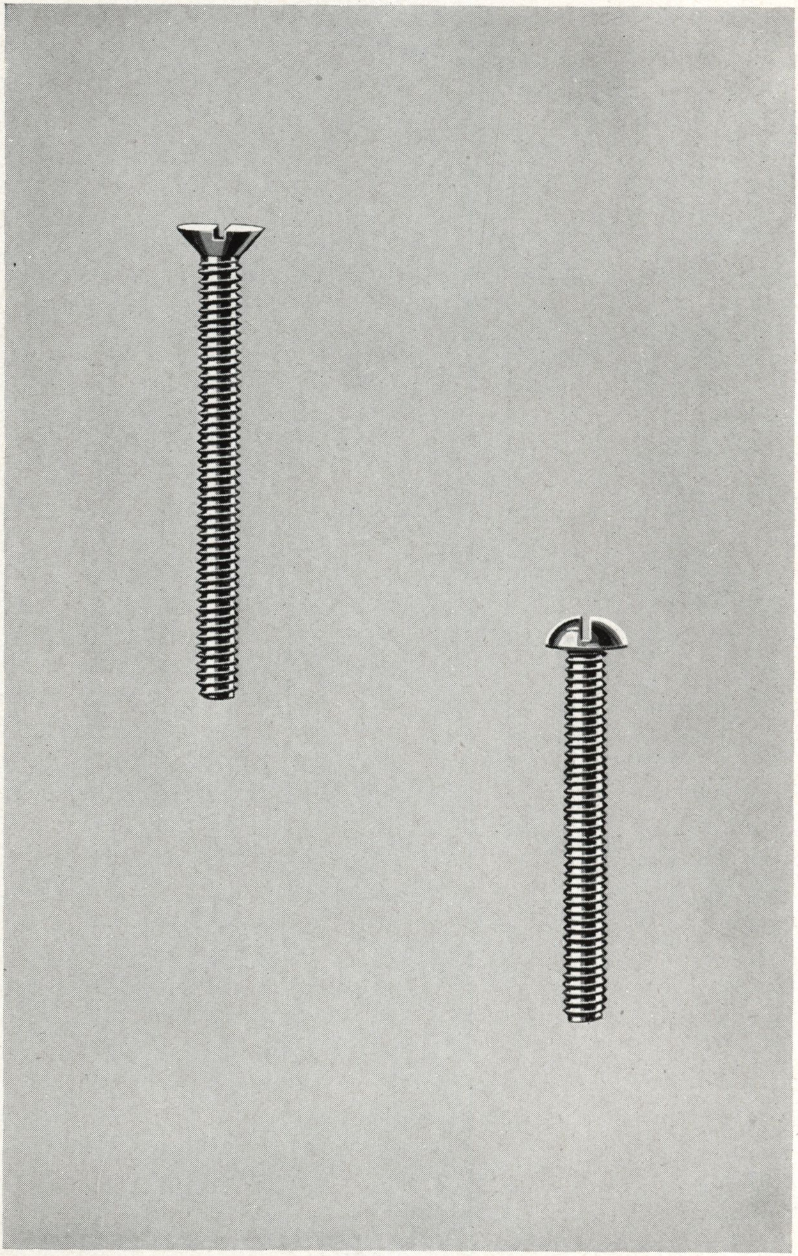
LIST PRICE PER GROSS

Threads Per Inch	56	48	40	32	32	24	24	20	18	16
	64	56	48	40	36	32	28	28	24	24
Diam.	2	3	4	6	8	10	12	¼	5/16	⅜
Length										
⅛	$0.30	$0.30	$0.30	$0.35						
3/16	.30	.30	.30	.35	$0.40					
¼	.30	.30	.30	.35	.40	$0.60				
5/16	.32	.32	.32	.37	.44	.65	$0.75	$1.15		
⅜	.32	.32	.32	.37	.44	.65	.75	1.15		
7/16	.34	.34	.34	.39	.48	.70	.80	1.20		
½	.34	.34	.34	.39	.48	.70	.80	1.20	$2.00	$2.40
⅝	.37	.37	.37	.42	.52	.75	.85	1.25	2.10	2.50
¾	.41	.41	.41	.46	.56	.80	.90	1.30	2.20	2.60
⅞	.45	.45	.45	.50	.60	.85	.95	1.40	2.30	2.70
1			.50	.55	.65	.90	1.00	1.50	2.40	2.80
1⅛			.55	.60	.70	1.00	1.10	1.60	2.60	3.00
1¼			.60	.65	.75	1.10	1.20	1.75	2.80	3.20
1½			.70	.75	.85	1.30	1.40	2.10	3.20	3.60
1¾				.95	1.05	1.50	1.60	2.50	3.60	4.20
2				1.15	1.25	1.70	1.80	2.90	4.00	4.60
2¼					1.45	1.90	2.20	3.30	4.40	4.80
2½					1.65	2.20	2.50	3.50	4.90	5.30
2¾					1.90	2.50	2.90	4.00	5.40	5.90
3					2.30	2.90	3.50	4.50	6.00	7.40

NOT CARRIED IN STOCK

Made to order in Quantity only

Machine Screws
Screw Machine & Special Work
Tables



Brass
Machine Screws

List of June 15, 1921

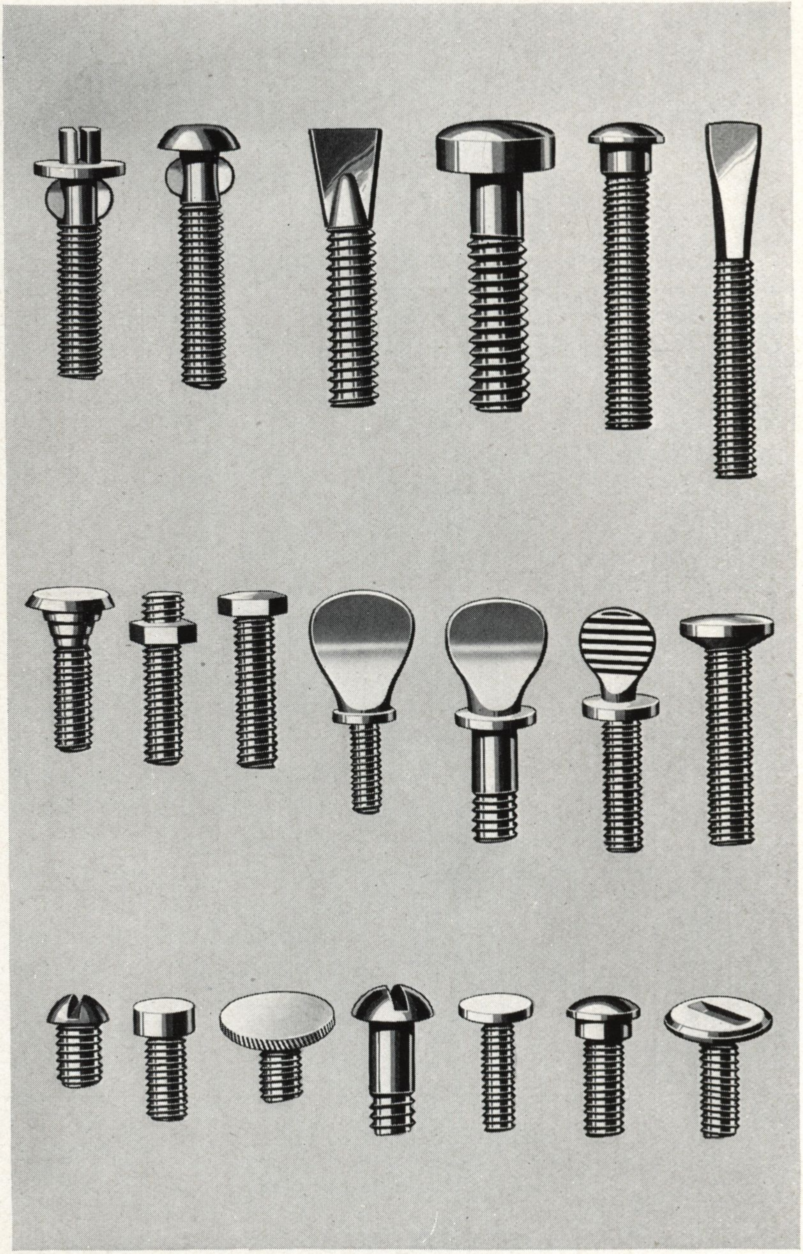
LIST PRICE PER GROSS

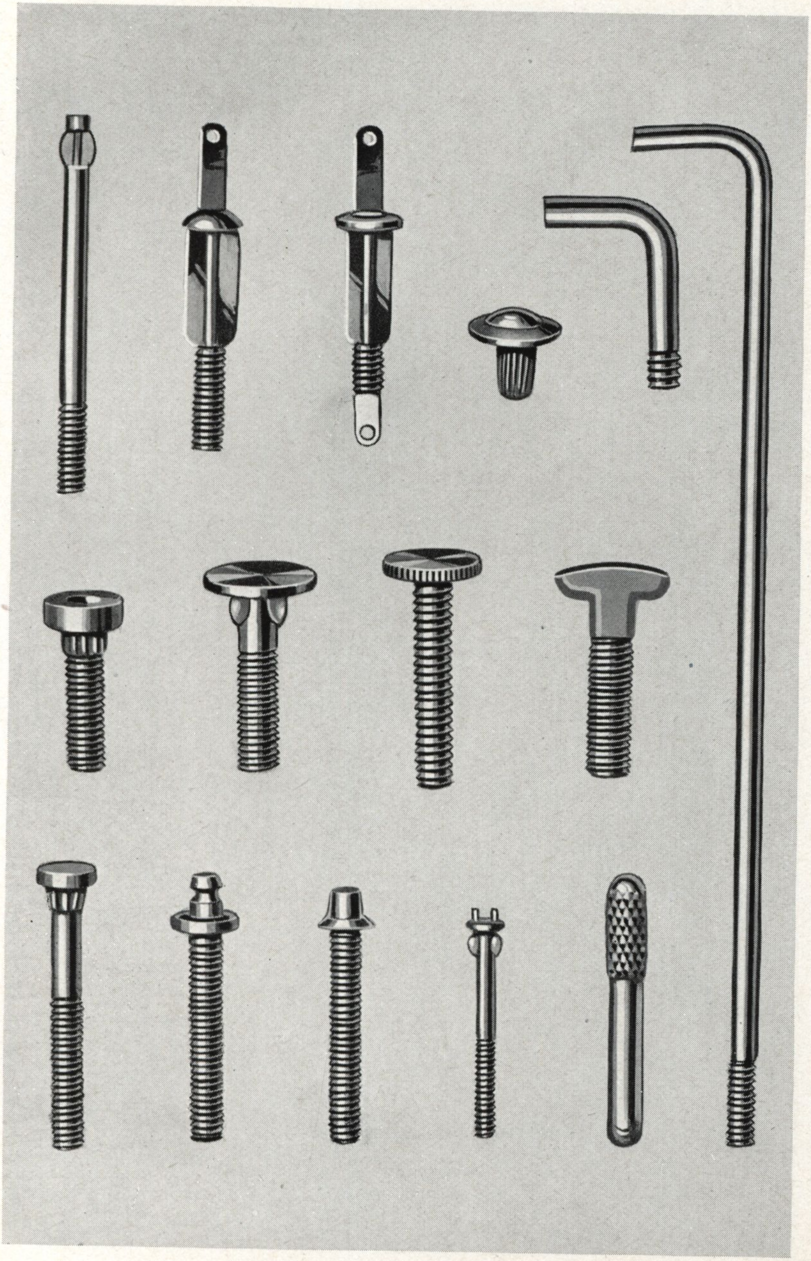
Threads Per Inch	56	48	40	32	32	24	24	20	18	16
	64	56	48	40	36	32	28	28	24	24
Diam.	2	3	4	6	8	10	12	¼	5/16	⅜
Length										
⅛	$0.32	$0.32	$0.36	$0.46						
3/16	.32	.32	.36	.46	$0.70					
¼	.32	.32	.36	.46	.70	$1.00				
5/16	.34	.34	.38	.49	.75	1.05	$1.35	$2.80		
⅜	.36	.36	.40	.52	.80	1.10	1.45	2.90		
7/16	.38	.38	.42	.55	.85	1.15	1.55	3.05		
½	.40	.40	.44	.58	.90	1.25	1.65	3.20	5.00	5.75
⅝	.46	.46	.50	.66	1.00	1.45	1.85	3.50	5.50	6.50
¾	.52	.52	.56	.74	1.10	1.65	2.05	3.80	6.00	6.70
⅞	.58	.58	.62	.82	1.20	1.85	2.25	4.10	6.50	7.40
1			.70	.90	1.30	2.05	2.45	4.40	7.00	8.50
1⅛			.80	1.05	1.45	2.20	2.65	4.65	7.50	9.00
1¼			.90	1.20	1.60	2.35	2.85	4.90	8.00	9.90
1½			1.10	1.50	1.90	2.65	3.25	5.50	9.00	12.00
1¾				1.90	2.30	3.05	3.75	6.20	10.00	12.70
2				2.30	2.70	3.45	4.25	7.00	11.00	13.50
2¼					3.10	3.85	4.75	8.00	12.00	14.90
2½						4.65	5.80	9.00	13.50	15.50
2¾						6.00	7.00	10.00	15.00	17.00
3						7.50	8.50	11.00	16.50	19.00

NOT CARRIED IN STOCK

Made to Order in Quantity Only

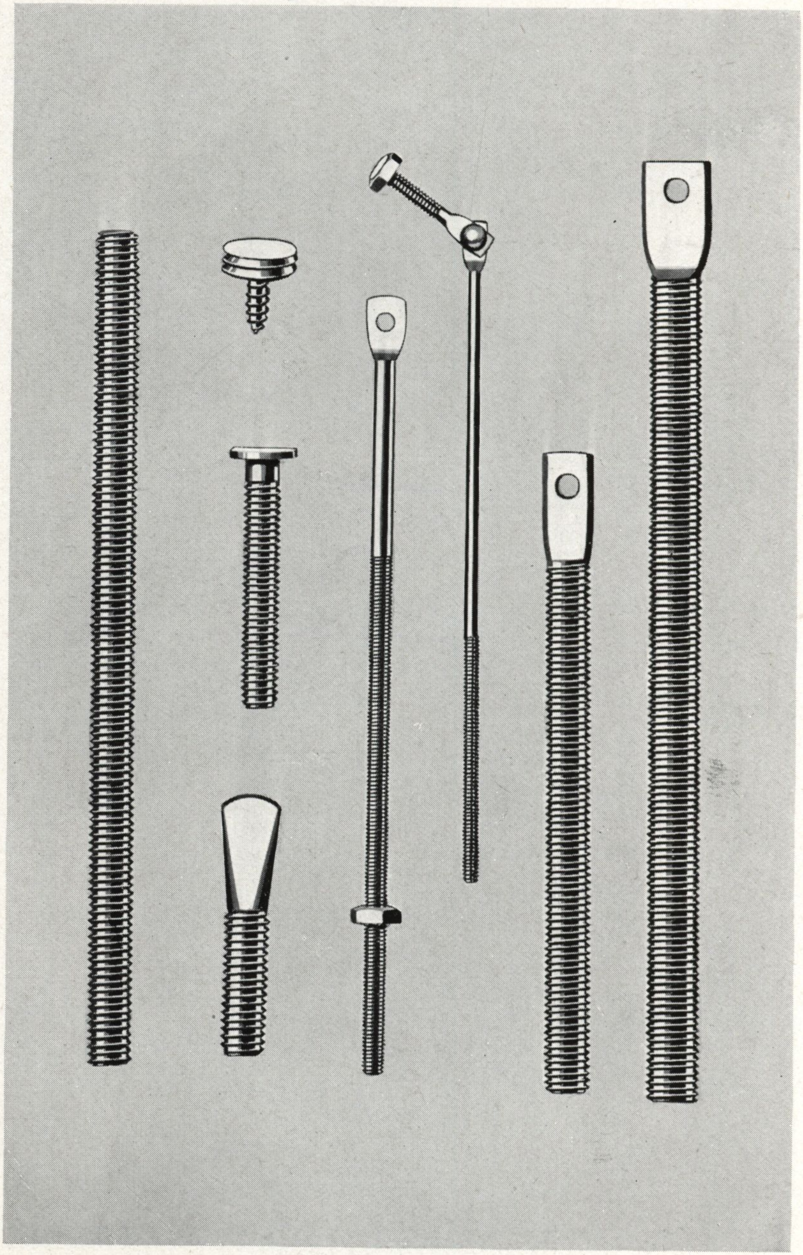
Screw Machine & Special Work
Tables

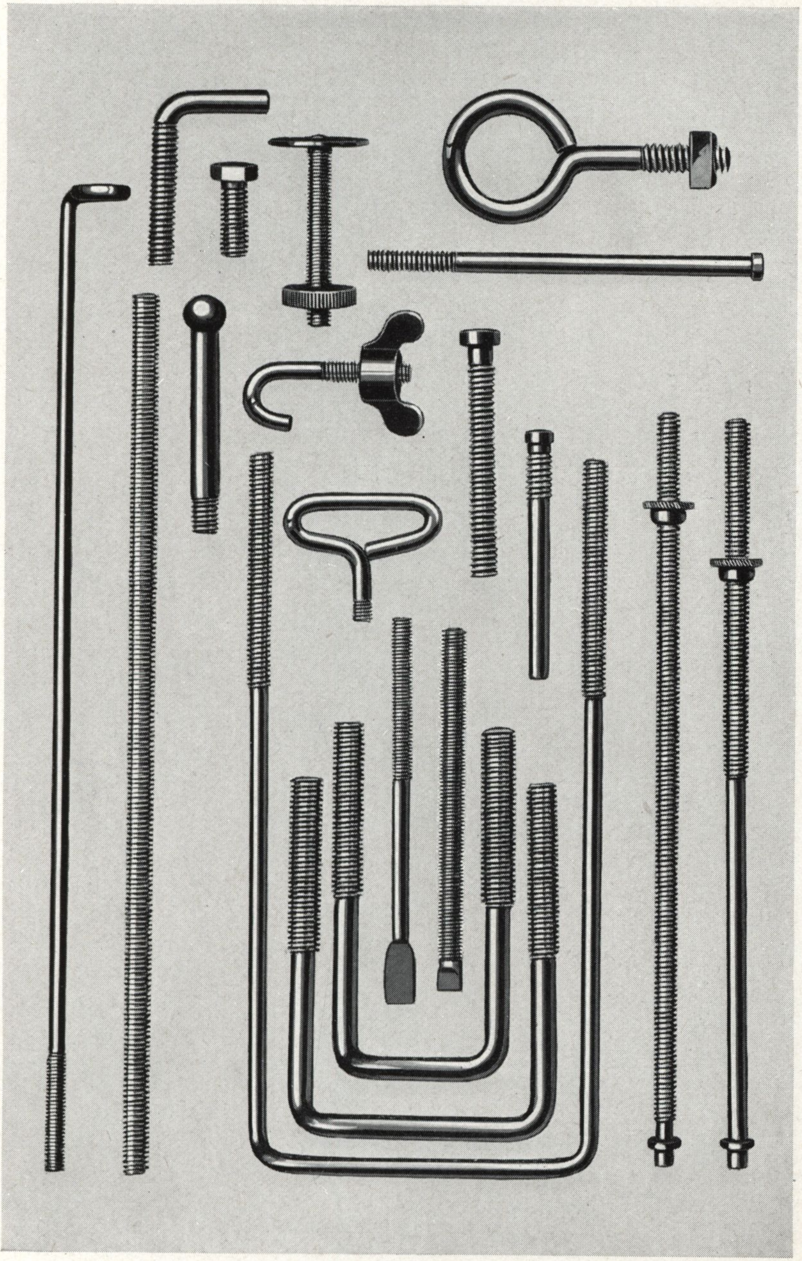




Screw Machine
& Special Work

Tables





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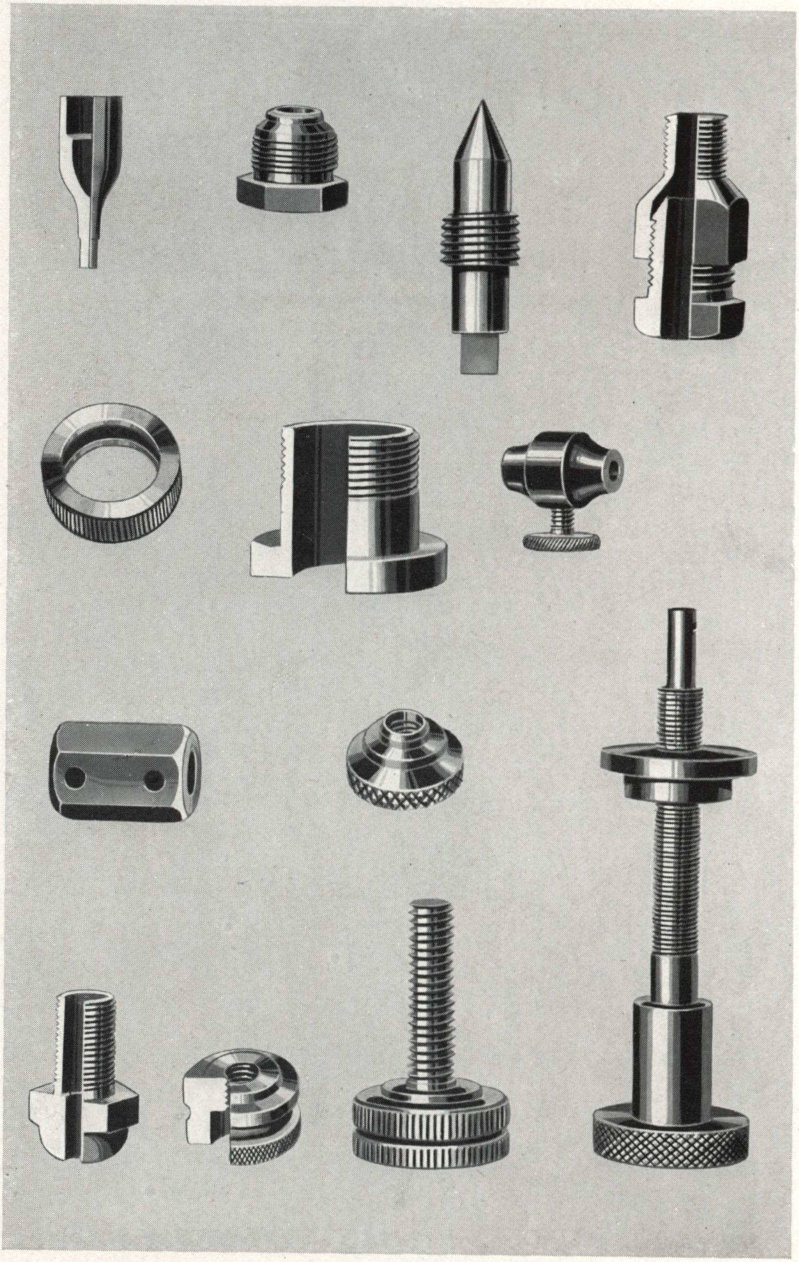
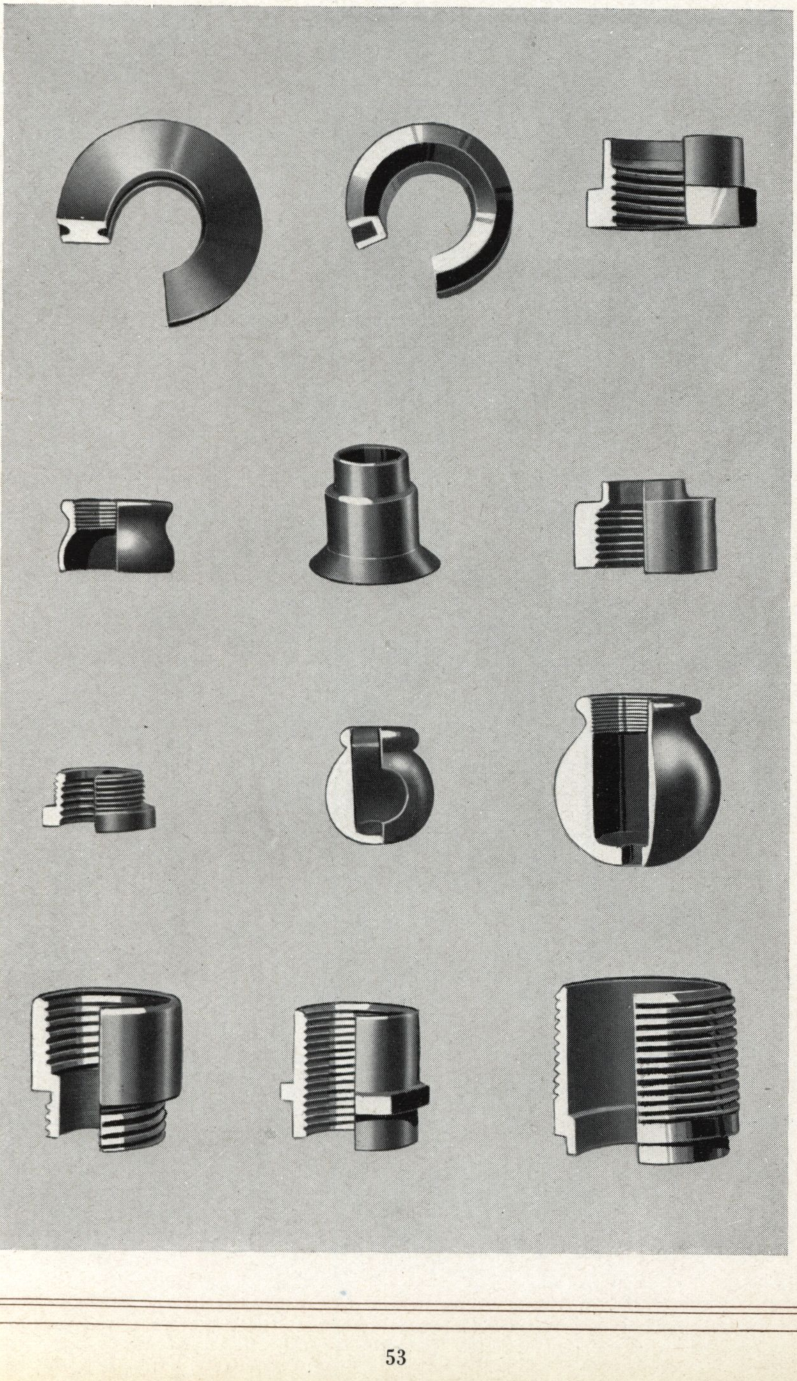
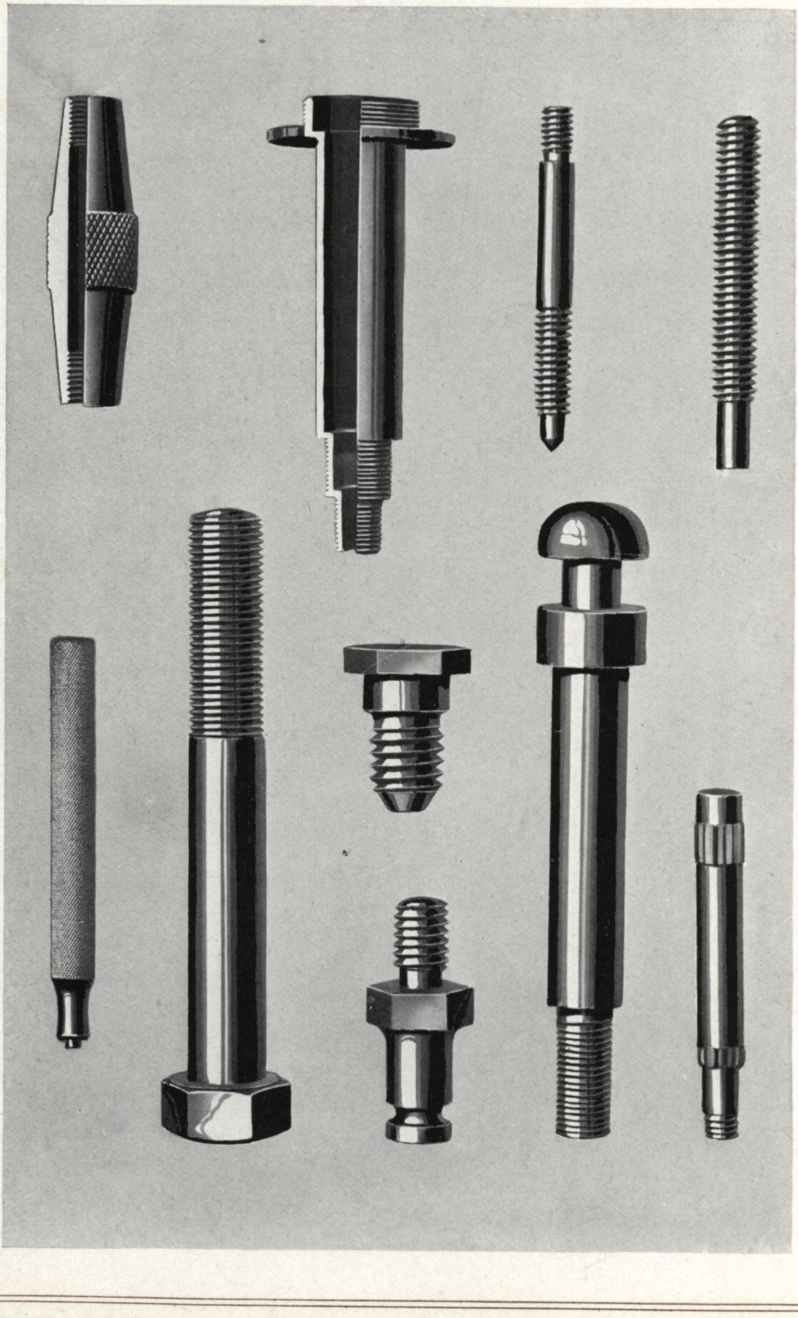
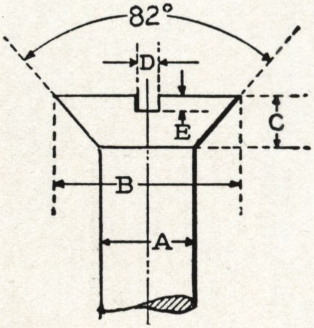


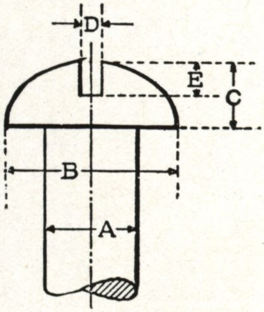




Tables

A.S.M.E.
Standard Proportions For Machine Screws





No.	FLAT HEAD					ROUND HEAD				
	A	B	C	D	E	A	B	C	D	E
2	.086	.164	.045	.030	.015	.086	.154	.060	.030	.040
3	.099	.190	.052	.032	.017	.099	.178	.069	.032	.044
4	.112	.216	.060	.034	.020	.112	.202	.078	.034	.049
5	.125	.242	.067	.037	.022	.125	.226	.087	.037	.053
6	.138	.268	.075	.039	.025	.138	.250	.097	.039	.058
8	.164	.320	.090	.043	.030	.164	.298	.115	.043	.067
10	.190	.372	.105	.048	.035	.190	.346	.133	.048	.076
12	.216	.424	.120	.052	.040	.216	.394	.151	.052	.085
¼	.250	.492	.139	.058	.046	.250	.458	.175	.058	.098
5/16	.3125	.617	.175	.069	.058	.3125	.573	.219	.069	.119
3/8	.375	.742	.211	.080	.070	.375	.689	.263	.080	.141

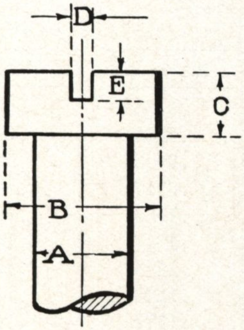
Formula

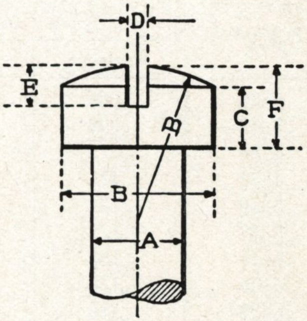
A = Diameter of body.
$B = 2A - .008$ = Diameter of head.
$C = \frac{A - .008}{1.739}$ = Thickness of head.
$D = .173A + .015$ = Width of slot.
$E = \frac{1}{3}C$ = Depth of slot.

Formula

A = Diameter of body.
$B = 1.85A - .005$ = Diameter of head.
$C = .7A$ = Height of head.
$D = .173A + .015$ = Width of slot.
$E = \frac{1}{2}C + .01$ = Depth of slot.

A.S.M.E.
Standard Proportions For Machine Screws





No.	FLAT FILLISTER HEAD					OVAL FILLISTER HEAD					
	A	B	C	D	E	A	B	C	D	E	F
2	.086	.132	.055	.030	.027	.086	.132	.055	.030	.036	.073
3	.099	.153	.063	.032	.032	.099	.153	.063	.032	.042	.084
4	.112	.175	.072	.034	.036	.112	.175	.072	.034	.048	.095
5	.125	.196	.081	.037	.040	.125	.196	.081	.037	.053	.107
6	.138	.217	.089	.039	.044	.138	.217	.089	.039	.059	.118
8	.164	.260	.106	.043	.053	.164	.260	.106	.043	.071	.141
10	.190	.303	.123	.048	.062	.190	.303	.123	.048	.082	.164
12	.216	.345	.141	.052	.070	.216	.345	.141	.052	.093	.187
¼	.250	.401	.163	.058	.082	.250	.401	.163	.058	.109	.217
5/16	.3125	.504	.204	.069	.102	.3125	.504	.204	.069	.136	.272
⅜	.375	.606	.246	.080	.123	.375	.606	.246	.080	.164	.327

Formula

A = diameter of body.
B = 1.64A—.009 = diameter of head.

C = .66A—.002 = height of head.
D = .173A + .015 = width of slot.
E = ½C = depth of slot.

Formula

A = diameter of body.
B = 1.64A—.009 = diam. of head and radius of oval.
C = .66A—.002 = height of side.
D = .173A + .015 = width of slot.
E = ½F = depth of slot.
F = .134B + C = height of head.

Table for Machine Screw Dimensions

(According to A.S.M.E. Formula)

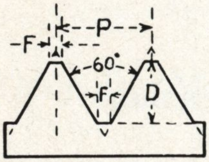
SCREW SIZE	OUTSIDE DIAMETER		PITCH DIAMETER	
	Maximum	Minimum	Maximum	Minimum
2–56	.086	.0825	.0744	.0727
3–48	.099	.0952	.0855	.0836
4–36	.112	.1076	.0940	.0918
4–32	.112	.1073	.0917	.0894
5–40	.125	.1208	.1088	.1067
5–32	.125	.1203	.1047	.1024
6–40	.138	.1338	.1218	.1197
6–36	.138	.1336	.1200	.1178
6–32	.138	.1333	.1177	.1154
8–36	.164	.1596	.1460	.1438
8–32	.164	.1593	.1437	.1414
8–30	.164	.1592	.1424	.1400
10–32	.190	.1853	.1697	.1674
10–30	.190	.1852	.1684	.1660
10–28	.190	.1851	.1668	.1644
10–24	.190	.1848	.1629	.1603
12–28	.216	.2111	.1928	.1904
12–24	.216	.2108	.1889	.1863
14–24	.242	.2368	.2149	.2123
14–20	.242	.2364	.2095	.2067
16–22	.268	.2626	.2385	.2358
16–20	.268	.2624	.2355	.2327
16–18	.268	.2622	.2319	.2290
16–16	.268	.2620	.2274	.2244
18–20	.294	.2884	.2615	.2587
18–18	.294	.2882	.2579	.2550
18–16	.294	.2880	.2534	.2504
20–20	.320	.3144	.2875	.2847
20–18	.320	.3142	.2839	.2810
20–16	.320	.3140	.2794	.2764
24–18	.372	.3662	.3359	.3330
24–16	.372	.3660	.3314	.3284
30–14	.450	.4438	.4036	.4005

5/16 – 312½

Table of Tap Dimensions

(According to A.S.M.E. Formula)

TAP SIZE	OUTSIDE DIAMETER		PITCH DIAMETER	
	Maximum	Minimum	Maximum	Minimum
2–56	.0903	.0872	.0767	.0756
3–48	.1038	.1003	.0880	.0868
4–36	.1179	.1135	.0969	.0955
4–32	.1185	.1136	.0948	.0933
5–40	.1305	.1264	.1116	.1102
5–32	.1315	.1266	.1078	.1063
6–40	.1435	.1394	.1246	.1232
6–36	.1439	.1395	.1229	.1215
6–32	.1445	.1396	.1208	.1193
8–36	.1699	.1655	.1489	.1475
8–32	.1705	.1656	.1468	.1453
8–30	.1708	.1656	.1456	.1440
10–32	.1965	.1916	.1728	.1713
10–30	.1968	.1916	.1716	.1700
10–28	.1972	.1916	.1701	.1684
10–24	.1980	.1918	.1664	.1647
12–28	.2232	.2176	.1961	.1944
12–24	.2240	.2178	.1924	.1907
14–24	.2500	.2438	.2184	.2167
14–20	.2511	.2439	.2132	.2114
16–22	.2765	.2698	.2421	.2403
16–20	.2771	.2699	.2392	.2374
16–18	.2779	.2699	.2358	.2338
16–16	.2788	.2700	.2314	.2294
18–20	.3031	.2959	.2652	.2634
18–18	.3039	.2959	.2618	.2598
18–16	.3048	.2960	.2574	.2554
20–20	.3291	.3219	.2912	.2894
20–18	.3299	.3219	.2878	.2858
20–16	.3308	.3220	.2834	.2814
24–18	.3819	.3739	.3398	.3378
24–16	.3828	.3740	.3354	.3334
30–14	.4619	.4521	.4078	.4057



U. S. Standard Thread

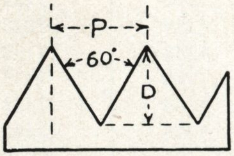
FORMULA:

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .6495$$

$$f = \text{flat} = \frac{p}{8}$$

Diameter	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8
No. Threads per in.	20	18	16	14	13	12	11	10	9
Diameter	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
No. Threads per in.	8	7	7	6	6	5 1/2	5	5	4 1/2
Diameter	2 1/8	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8
No. Threads per in.	4 1/2	4 1/2	4	4	4	4	3 1/2	3 1/2	3 1/2
Diameter	3 1/4	3 3/8	3 1/2	3 5/8	3 3/4	3 7/8	4		
No. Threads per in.	3 1/2	3 1/4	3 1/4	3 1/4	3	3	3		



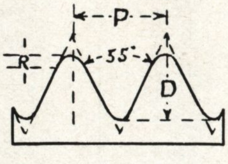
Sharp V Thread

FORMULA:

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .8660$$

Diameter	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16
No. Threads per in.	20	18	16	14	12	12	11	11	10	10
Diameter	7/8	5/16	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8
No. Threads per in.	9	9	8	7	7	6	6	5	5	4 1/2
Diameter	2	2 1/8	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8
No. Threads per in.	4 1/2	4 1/2	4 1/2	4 1/2	4	4	4	4	3 1/2	3 1/2
Diameter	3 1/4	3 3/8	3 1/2	3 5/8	3 3/4	3 7/8	4			
No. Threads per in.	3 1/2	3 1/4	3 1/4	3 1/4	3	3	3			



Whitworth Standard Thread

FORMULA:

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .64033$$

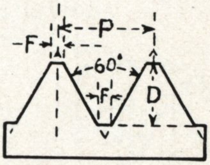
$$r = \text{radius} = p \times .1373$$

Diameter	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16
No. Threads per in.	20	18	16	14	12	12	11	11	10	10
Diameter	7/8	15/16	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8
No. Threads per in.	9	9	8	7	7	6	6	5	5	4 1/2
Diameter	2	2 1/8	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8
No. Threads per in.	4 1/2	4 1/2	4	4	4	4	3 1/2	3 1/2	3 1/2	3 1/2
Diameter	3 1/4	3 3/8	3 1/2	3 5/8	3 3/4	3 7/8	4			
No. Threads per in.	3 1/4	3 1/4	3 1/4	3 1/4	3	3	3			

Society of Automobile Engineers

S.A.E. (formerly A.L.A.M.) Standard Thread

Form of Thread
U. S. Standard



FORMULA:

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .64952$$

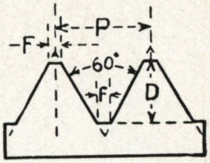
$$f = \text{flat} = \frac{p}{8}$$

Diameter	¼	5/16	⅜	7/16	½	9/16	⅝	11/16	¾	⅞	1
No. Threads per in.	28	24	24	20	20	18	18	16	16	14	14

American Society of Mechanical Engineers

A.S.M.E. Standard Thread

Form of Thread
U. S. Standard



FORMULA:

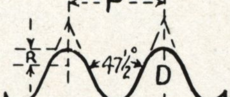
$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .64952$$

$$f = \text{flat} = \frac{p}{8}$$

Size of Screw Gauge	0	1	2	3	4	5	6	7	8	9	10	12	14	16
No. Threads per in.	80	72	64	56	48	44	40	36	36	32	30	28	24	22
Size of Screw Gauge	18	20	22	24	26	28	30							
No. Threads per in.	20	20	18	16	16	14	14							

British Association Standard Thread



FORMULA:

$$p = \text{pitch}$$

$$d = \text{depth} = p \times .6$$

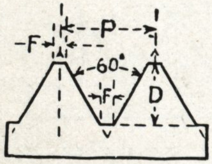
$$r = \text{radius} = \frac{2 \times p}{11}$$

Number	0	1	2	3	4	5	6
Diameter, m/m	6.0	5.3	4.7	4.1	3.64	3.2	2.8
Pitch (p), m/m	1.00	0.90	0.81	0.73	0.66	0.59	0.53

Number	7	8	9	10	12	14	19
Diameter, m/m	2.5	2.2	1.9	1.7	1.3	1.0	.79
Pitch (p), m/m	0.48	0.43	0.39	0.35	0.28	0.23	0.19

United States Standard Form Thread

Including S. A. E. Standard



Formula

$$p = \text{pitch} = \frac{1}{\text{No. threads per inch}}$$

$$d = \text{depth} = p \times .64952$$

$$f = \text{flat} = \frac{p}{8}$$

[1] Basic Thread Dimensions and Drill Sizes

	Diameter Inches	Threads per Inch			Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	[2] Tap Drill Size
		U. S. Std.	S. A. E. Std.	U. S. Form				
	1/16	..	..	60	.0625	.0517	.0409	56
	1/16	64	..	..	.0625	.0524	.0422	56
	1/16	..	..	72	.0625	.0535	.0445	55
	5/64	..	..	56	.0781	.0665	.0549	1/16
	5/64	60	..	..	.0781	.0673	.0565	1/16
	3/32	..	..	48	.0938	.0803	.0667	49
	3/32	50	..	..	.0938	.0808	.0678	49
	3/32	..	..	56	.0938	.0821	.0706	48
	3/32	..	..	60	.0938	.0829	.0721	47
	7/64	48	..	..	.1094	.0959	.0823	43
	1/8	..	..	32	.1250	.1047	.0844	41
	1/8	..	..	36	.1250	.1070	.0889	40
5	1/8	40	..	..	.1250	.1088	.0925	38
	1/8	..	..	48	.1250	.1115	.0979	37
6	9/64	..	..	32	.1406	.1203	.1000	34
	9/64	..	..	36	.1406	.1226	.1045	33
	9/64	40	..	..	.1406	.1244	.1081	32
	5/32	..	..	32	.1563	.1360	.1157	1/8
	5/32	36	..	..	.1563	.1382	.1202	30
	5/32	..	..	40	.1563	.1400	.1238	30
8	11/64	32	..	..	.1719	.1505	.1313	9/64
	11/64	..	..	36	.1719	.1538	.1358	27
10	3/16	24	..	..	.1875	.1604	.1334	26
	3/16	..	..	30	.1875	.1658	.1442	5/32
	3/16	..	..	32	.1875	.1672	.1469	22
	3/16	..	..	36	.1875	.1695	.1514	20
	13/64	24	..	..	.2031	.1760	.1490	20

(List continued on following page)

[1] Taps are made slightly larger than basic sizes.

[2] Commercial Tap Drill to produce approximately 75% full thread.

United States Standard Form Thread

Including S. A. E. Standard

(Continued)

[1]Basic Thread Dimensions and Tap Drill Sizes

Diameter Inches	Threads per Inch			Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	[2]Tap Drill Size
	U. S. Std.	S. A. E. Std.	U. S. Form				
13/64	..	..	32	.2031	.1828	.1625	17
7/32	24	..	..	.2188	.1916	.1646	16
7/32	..	..	28	.2188	.1956	.1724	13
7/32	..	..	32	.2188	.1985	.1782	3/16
15/64	24	..	..	.2344	.2073	.1806	10
15/64	..	..	28	.2344	.2112	.1880	8
15/64	..	..	32	.2344	.2141	.1942	6
1/4	20	..	..	.2500	.2176	.1850	7
1/4	..	..	24	.2500	.2229	.1959	4
1/4	..	28	..	.2500	.2268	.2036	3
1/4	..	..	32	.2500	.2297	.2094	2
5/16	18	..	..	.3125	.2764	.2403	F
5/16	..	..	20	.3125	.2800	.2476	17/64
5/16	..	24	..	.3125	.2854	.2584	I
5/16	..	..	32	.3125	.2922	.2719	9/32
3/8	16	..	..	.3750	.3344	.2938	O
3/8	..	..	18	.3750	.3389	.3029	P
3/8	..	..	20	.3750	.3425	.3100	21/64
3/8	..	24	..	.3750	.3479	.3209	Q
7/16	14	..	..	.4375	.3911	.3447	U
7/16	..	20	..	.4375	.4050	.3726	25/64
7/16	..	..	24	.4375	.4104	.3834	X
1/2	..	..	12	.5000	.4459	.3918	27/64
1/2	13	..	..	.5000	.4501	.4001	27/64
1/2	..	20	..	.5000	.4675	.4351	29/64
1/2	..	..	24	.5000	.4729	.4459	29/64
9/16	12	..	..	.5625	.5084	.4542	31/64
9/16	..	18	..	.5625	.5264	.4903	33/64
5/8	11	..	..	.6250	.5660	.5069	17/32
5/8	..	..	12	.6250	.5709	.5168	35/64
5/8	..	18	..	.6250	.5889	.5528	37/64
11/16	11	..	..	.6875	.6285	.5694	19/32
11/16	..	..	12	.6875	.6334	.5793	39/64
11/16	..	16	..	.6875	.6469	.6063	5/8
3/4	10	..	..	.7500	.6851	.6201	21/32
3/4	..	..	12	.7500	.6959	.6418	43/64
3/4	..	16	..	.7500	.7094	.6688	11/16

(List concluded on following page)

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[1] Taps are made slightly larger than basic sizes.

[2] Commercial Tap Drill to produce approximately 75% full thread.

United States Standard Form Thread

Including S. A. E. Standard

(Concluded)

[1] Basic Thread Dimensions and Tap Drill Sizes

Diameter Inches	Threads per Inch			Outside Diameter Inches	Pitch Diameter Inches	Root Diameter Inches	[2] Tap Drill Size
	U. S. Std.	S. A. E. Std.	U. S. Form				
13/16	10	..	..	.8125	.7476	.6826	23/32
13/16	..	..	12	.8125	.7584	.7043	47/64
7/8	9	..	..	.8750	.8029	.7307	49/64
7/8	..	..	12	.8750	.8209	.7668	51/64
7/8	..	14	..	.8750	.8286	.7822	13/16
7/8	..	18	..	.8750	.8389	.8028	53/64
15/16	9	..	..	.9375	.8654	.7932	53/64
15/16	..	..	12	.9375	.8834	.8293	55/64
1	8	..	..	1.0000	.9188	.8376	7/8
1	..	..	12	1.0000	.9459	.8918	59/64
1	..	14	..	1.0000	.9536	.9072	15/16
1 1/16	8	..	..	1.0625	.9813	.9001	15/16
1 1/8	7	..	..	1.1250	1.0322	.9394	63/64
1 1/8	..	12	..	1.1250	1.0709	1.0168	1 3/64
1 3/16	7	..	..	1.1875	1.0947	1.0019	1 3/64
1 1/4	7	..	..	1.2500	1.1572	1.0644	1 7/64
1 1/4	..	12	..	1.2500	1.1959	1.1418	1 11/64
1 5/16	7	..	..	1.3125	1.2197	1.1269	1 11/64
1 3/8	6	..	..	1.3750	1.2668	1.1585	1 7/32
1 3/8	..	12	..	1.3750	1.3209	1.2668	1 19/64
1 7/16	6	..	..	1.4375	1.3293	1.2210	1 9/32
1 1/2	6	..	..	1.5000	1.3918	1.2835	1 11/32
1 1/2	..	12	..	1.5000	1.4459	1.3918	1 27/64
1 5/8	5 1/2	..	..	1.6250	1.5070	1.3888	1 29/64
1 3/4	5	..	..	1.7500	1.6201	1.4902	1 9/16
1 7/8	5	..	..	1.8750	1.7451	1.6152	1 11/16
2	4 1/2	..	..	2.0000	1.8557	1.7113	1 25/32
2 1/8	4 1/2	..	..	2.1250	1.9807	1.8363	1 29/32
2 1/4	4 1/2	..	..	2.2500	2.1057	1.9613	2 1/32
2 3/8	4	..	..	2.3750	2.2126	2.0502	2 9/64
2 1/2	4	..	..	2.5000	2.3376	2.1752	2 1/4
2 3/4	4	..	..	2.7500	2.5876	2.4252	2 1/2
3	3 1/2	..	..	3.0000	2.8145	2.6288	2 23/32
3 1/4	3 1/2	..	..	3.2500	3.0645	2.8788	2 31/32
3 1/2	3 1/4	..	..	3.5000	3.3002	3.1003	3 13/64
3 3/4	3	..	..	3.7500	3.5335	3.3170	3 27/64
4	3	..	..	4.0000	3.7835	3.5670	3 43/64

[1] Taps are made slightly larger than basic sizes.

[2] Commercial Tap Drill to produce approximately 75% full thread.

Drill Size Decimal Equivalents

Drill	Equivalent	Drill	Equivalent	Drill	Equivalent
.1 mm	.003937	65	.033000	1.85mm	.072834
.15mm	.005905	.85mm	.033464	49	.073000
.2mm	.007874	64	.035000	1.9 mm	.074803
.25mm	.009842	.9mm	.035433	48	.076000
.3 mm	.011811	63	.036000	1.95mm	.076771
80	.013000	62	.037000	5/64	.078125
79½	.013500	.95mm	.037401	47	.078500
.35mm	.013779	61	.038000	2. mm	.078740
79	.014000	60½	.039000	2.05mm	.080708
78½	.014500	1. mm	.039370	46	.081000
78	.015000	60	.040000	45	.082000
1/64	.015625	59	.041000	2.1 mm	.082677
.4 mm	.015748	1.05mm	.041338	2.15mm	.084645
77	.016000	58	.042000	44	.086000
.45mm	.017716	57	.043000	2.2 mm	.086614
76	.018000	1.1 mm	.043307	2.25mm	.088582
.5 mm	.019685	1.15mm	.045275	43	.089000
75	.020000	56	.046500	2.3 mm	.090551
74½	.021000	3/64	.046875	2.35mm	.092519
.55mm	.021653	1.2 mm	.047244	42	.093500
74	.022000	1.25mm	.049212	3/32	.093750
73½	.022500	1.3 mm	.051181	2.4 mm	.094488
73	.023000	55	.052000	41	.096000
.6 mm	.023622	1.35mm	.053149	2.45mm	.096456
72	.024000	54	.055000	40	.098000
71½	.025000	1.4 mm	.055118	2.5 mm	.098425
.65mm	.025590	1.45mm	.057086	39	.099500
71	.026000	1.5 mm	.059055	38	.101500
70	.027000	53	.059500	2.6 mm	.102362
.7 mm	.027559	1.55mm	.061023	37	.104000
69½	.028000	1/16	.062500	2.7 mm	.106299
69	.029000	1.6 mm	.062992	36	.106500
68½	.029250	52	.063500	2.75mm	.108267
.75mm	.029527	1.65mm	.064960	7/64	.109375
68	.030000	1.7 mm	.066929	35	.110000
67	.031000	51	.067000	2.8 mm	.110236
1/32	.031250	1.75mm	.068897	34	.111000
.8 mm	.031496	50	.070000	33	.113000
66	.032000	1.8 mm	.070866	2.9 mm	.114173

(List continued on following page)

Drill Size Decimal Equivalents

(Continued)

Drill	Equivalent	Drill	Equivalent	Drill	Equivalent
32	.116000	4.5 mm	177165	B	.238000
3. mm	.118110	15	.180000	6.1 mm	.240157
31	.120000	4.6 mm	.181102	C	.242000
3.1 mm	.122047	14	.182000	6.2 mm	.244094
1/8	.125000	13	.185000	D	.246000
3.2 mm	.125984	4.7 mm	.185039	6.25 mm	.246062
3.25 mm	.127952	4.75 mm	.187007	6.3 mm	.248031
30	.128500	3/16	.187500	E1/4	.250000
3.3 mm	.129921	4.8 mm	.188976	6.4 mm	.251968
3.4 mm	.133858	12	.189000	6.5 mm	.255905
29	.136000	11	.191000	F	.257000
3.5 mm	.137795	4.9 mm	.192913	6.6 mm	.259842
28	.140500	10	.193500	G	.261000
9/64	.140625	9	.196000	6.7 mm	.263779
3.6 mm	.141732	5. mm	.196850	17/64	.265625
27	.144000	8	.199000	6.75 mm	.265747
3.7 mm	.145669	5.1 mm	.200787	H	.266000
26	.147000	7	.201000	6.8 mm	.267716
3.75 mm	.147637	13/64	.203125	6.9 mm	.271653
25	.149500	6	.204000	I	.272000
3.8 mm	.149606	5.2 mm	.204724	7. mm	.275590
24	.152000	5	.205500	J	.277000
3.9 mm	.153543	5.25 mm	.206692	7.1 mm	.279527
23	.154000	5.3 mm	.208661	K	.281000
5/32	.156250	4	.209000	9/32	.281250
22	.157000	5.4 mm	.212598	7.2 mm	.283464
4. mm	.157480	3 2?	.213000	7.25 mm	.285432
21	.159000	5.5 mm	.216535	7.3 mm	.287401
20	.161000	7/32	.218750	L	.290000
4.1 mm	.161417	5.6 mm	.220472	7.4 mm	.291338
4.2 mm	.165354	3 2?	.221000	M	.295000
19	.166000	5.7 mm	.224409	7.5 mm	.295275
4.25 mm	.167322	5.75 mm	.226377	19/64	.296875
4.3 mm	.169291	1	.228000	7.6 mm	.299212
18	.169500	5.8 mm	.228346	N	.302000
11/64	.171875	5.9 mm	.232283	7.7 mm	.303149
17	.173000	A	.234000	7.75 mm	.305117
4.4 mm	.173228	15/64	.234375	7.8 mm	.307086
16	.177000	6. mm	.236220	7.9 mm	.311023

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(List continued on following page)

Drill Size Decimal Equivalents

(Concluded)

Drill	Equivalent	Drill	Equivalent	Drill	Equivalent
5/16	.312500	10 mm	.393700	18 mm	.708660
8. mm	.314960	X	.397000	23/32	.718750
O	.316000	Y	.404000	18½mm	.728345
8.1 mm	.318897	13/32	.406250	47/64	.734375
8.2 mm	.322834	Z	.413000	19 mm	.748030
P	.323000	10½mm	.413385	3/4	.750000
8.25mm	.324802	27/64	.421875	49/64	.765625
8.3 mm	.326771	11 mm	.433070	19½mm	.767715
21/64	.328125	7/16	.437500	25/32	.781250
8.4 mm	.330708	11½mm	.452755	20 mm	.787400
Q	.332000	29/64	.453125	51/64	.796875
8.5 mm	.334645	15/32	.468750	20½mm	.807085
8.6 mm	.338582	12 mm	.472440	13/16	.812500
R	.339000	31/64	.484375	21 mm	.826770
8.7 mm	.342519	12½mm	.492125	53/64	.828125
11/32	.343750	1/2	.500000	27/32	.843750
8.75mm	.344487	13 mm	.511810	21½mm	.846455
8.8 mm	.346456	33/64	.515625	55/64	.859375
S	.348000	17/32	.531250	22 mm	.866140
8.9 mm	.350393	13½mm	.531495	7/8	.875000
9. mm	.354330	35/64	.546875	22½mm	.885825
T	.358000	14 mm	.551180	57/64	.890625
9.1 mm	.358267	9/16	.562500	23 mm	.905510
23/64	.359375	14½mm	.570865	29/32	.906250
9.2 mm	.362204	37/64	.578125	59/64	.921875
9.25mm	.364172	15 mm	.590550	23½mm	.925195
9.3 mm	.366141	19/32	.593750	15/16	.937500
U	.368000	39/64	.609375	24 mm	.944880
9.4 mm	.370078	15½mm	.610235	61/64	.953125
9.5 mm	.374015	5/8	.625000	24½mm	.964565
3/8	.375000	16 mm	.629920	31/32	.968750
V	.377000	41/64	.640625	25 mm	.984250
9.6 mm	.377952	16½mm	.649605	63/64	.984375
9.7 mm	.381889	21/32	.656250	1	1.000000
9.75mm	.383857	17 mm	.669290		
9.8 mm	.385826	43/64	.671875		
W	.386000	11/16	.687500		
9.9 mm	.389763	17½mm	.688975		
25/64	.390625	45/64	.703125		

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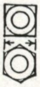
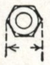
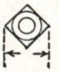
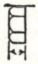
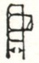
U. S. Standard Threads, Bolts and Nuts

The tap drill diameters in the table provide for a slight clearance at the root of the thread, in order to facilitate tapping and reduce tap breakages. If full threads are required, use the diameters at the root of the threads for the tap drill diameters.

Diameter	No. of Threads per Inch	Diameter at Root of Thread	Diameter of Tap Drill	Area in Square Inches		Tensile Strength at Stress of 6,000 Pounds per Square Inch	Dimensions of Nuts and Bolt Heads				
				Of Bolt	At Root of Thread						
¼	20	0.185	13/64	0.049	0.026	160	½	0.578	0.707	¼	¼
5/16	18	0.240	¼	0.076	0.045	270	19/32	0.686	0.840	5/16	19/64
⅜	16	0.294	5/16	0.110	0.068	410	11/16	0.794	0.972	⅜	11/32
7/16	14	0.345	23/64	0.150	0.093	560	25/32	0.902	1.105	7/16	25/64
½	13	0.400	27/64	0.196	0.126	760	⅞	1.011	1.237	½	7/16
9/16	12	0.454	15/32	0.248	0.162	1,000	31/32	1.119	1.370	9/16	31/64
⅝	11	0.507	17/32	0.307	0.202	1,210	1 1/16	1.227	1.502	⅝	17/32
¾	10	0.620	41/64	0.442	0.302	1,810	1¼	1.444	1.768	¾	⅝
⅞	9	0.731	¾	0.601	0.419	2,520	1 7/16	1.660	2.033	⅞	23/32
1	8	0.838	55/64	0.785	0.551	3,300	1⅝	1.877	2.298	1	13/16
1⅛	7	0.939	31/32	0.994	0.694	4,160	1 13/16	2.093	2.563	1⅛	29/32
1¼	7	1.064	1 3/32	1.227	0.893	5,350	2	2.310	2.828	1¼	1
1⅜	6	1.158	1 7/32	1.485	1.057	6,340	2 3/16	2.527	3.093	1⅜	1 3/32
1½	6	1.283	1 11/32	1.767	1.295	7,770	2⅜	2.743	3.358	1½	1 3/16
1⅝	5½	1.389	1 27/64	2.074	1.515	9,090	2 9/16	2.960	3.623	1⅝	1 9/32
1¾	5	1.490	1 17/32	2.405	1.746	10,470	2¾	3.176	3.889	1¾	1⅜
1⅞	5	1.615	1 21/32	2.761	2.051	12,300	2 15/16	3.393	4.154	1⅞	1 15/32
2	4½	1.711	1 49/64	3.142	2.302	13,800	3⅛	3.609	4.419	2	1 9/16
2¼	4½	1.961	2 1/64	3.976	3.023	18,100	3½	4.043	4.949	2¼	1¾
2½	4	2.175	2 15/64	4.909	3.719	22,300	3⅞	4.476	5.479	2½	1 15/16
2¾	4	2.425	2 31/64	5.940	4.620	27,700	4¼	4.909	6.010	2¾	2⅛
3	3½	2.629	2 11/16	7.069	5.428	32,500	4⅝	5.342	6.540	3	2 5/16
3¼	3½	2.879	2 15/16	8.296	6.510	39,000	5	5.775	7.070	3¼	2½
3½	3¼	3.100	3 11/64	9.621	7.548	45,300	5⅜	6.208	7.600	3½	2 11/16
3¾	3	3.317	3⅜	11.045	8.641	51,800	5¾	6.641	8.131	3¾	2⅞
4	3	3.567	3⅝	12.566	9.963	59,700	6⅛	7.074	8.661	4	3 1/16
4¼	2⅞	3.798	3 27/32	14.186	11.340	68,000	6½	7.508	9.191	4¼	3¼
4½	2¾	4.028	4 3/32	15.904	12.750	76,500	6⅞	7.941	9.721	4½	3 7/16
4¾	2⅝	4.255	4 5/16	17.721	14.215	85,500	7¼	8.374	10.252	4¾	3⅝
5	2½	4.480	4 9/16	19.635	15.760	94,000	7⅝	8.807	10.782	5	3 13/16
5¼	2½	4.730	4 13/16	21.648	17.570	105,500	8	9.240	11.312	5¼	4
5½	2⅜	4.953	5 1/32	23.758	19.260	116,000	8⅜	9.673	11.842	5½	4 3/16
5¾	2⅜	5.203	5 9/32	25.967	21.250	127,000	8¾	10.106	12.373	5¾	4⅜
6	2¼	5.423	5½	28.274	23.090	138,000	9⅛	10.539	12.903	6	4 9/16

Weight of Steel, Copper and Brass Wire Per 100 Feet

Birmingham Gauge	Diameter Inches	Steel, Lbs.	Copper, Lbs.	Brass, Lbs.
0000	.454	55.14	62.39	59.45
000	.425	48.32	54.67	52.00
00	.380	38.63	43.71	41.55
0	.340	30.92	34.99	33.25
1	.300	24.07	27.24	25.93
2	.284	21.57	24.41	23.22
3	.259	17.94	20.30	19.30
4	.238	15.15	17.15	16.31
5	.220	12.95	14.65	13.91
6	.203	11.02	12.47	11.86
7	.180	8.67	9.81	9.32
8	.165	7.28	8.24	7.83
9	.148	5.86	6.63	6.30
10	.134	4.80	5.43	5.16
11	.120	3.85	4.36	4.15
12	.109	3.18	3.59	3.42
13	.095	2.414	2.73	2.60
14	.083	1.842	2.085	1.980
15	.072	1.386	1.569	1.491
16	.065	1.130	1.278	1.214
17	.058	.899	1.018	.970
18	.049	.642	.726	.691
19	.042	.471	.534	.507
20	.035	.327	.37	.352
21	.032	.273	.31	.295
22	.028	.209	.237	.225
23	.025	.167	.189	.180
24	.022	.129	.146	.139
25	.020	.107	.121	.115
26	.018	.086	.098	.093
27	.016	.068	.077	.074
28	.014	.0524	.0594	.0564
29	.013	.0452	.0513	.0486
30	.012	.0385	.0437	.0415
31	.010	.0267	.0303	.0288
32	.009	.0217	.0245	.0233
33	.008	.0171	.0194	.0184
34	.007	.0131	.0148	.0141
35	.005	.0067	.0076	.0072
36	.004	.0043	.0048	.0046

To obtain the weight per 100 feet of other sizes, multiply the square of the diameter:

For Steel by 267. For Copper by 303. For Brass by 288.

Weight of Round, Square and Hexagon Steel Bars Per Foot

(One Cubic Foot of Steel Weighs 490 Lbs.)

Diam.	Round	Hexagon	Square	Diam.	Round	Hexagon	Square
1/8	.042	.046	.053	3/4	1.503	1.660	1.914
5/32	.065	.072	.082	25/32	1.630	1.800	2.075
3/16	.094	.104	.120	13/16	1.764	1.948	2.246
7/32	.128	.142	.163	27/32	1.901	2.099	2.420
1/4	.167	.184	.212	7/8	2.044	2.256	2.603
9/32	.211	.233	.268	29/32	2.193	2.421	2.791
5/16	.261	.288	.332	15/16	2.349	2.594	2.990
11/32	.315	.348	.401	31/32	2.508	2.769	3.190
3/8	.375	.414	.478	1	2.671	2.950	3.400
13/32	.442	.488	.563	1 1/16	3.015	3.329	3.839
7/16	.511	.564	.651	1 1/8	3.380	3.732	4.305
15/32	.586	.647	.746	1 3/16	3.770	4.166	4.798
1/2	.667	.737	.850	1 1/4	4.175	4.610	5.315
17/32	.754	.833	.960	1 5/16	4.601	5.080	5.858
9/16	.845	.933	1.077	1 3/8	5.051	5.579	6.430
19/32	.941	1.040	1.199	1 7/16	5.520	6.095	7.027
5/8	1.043	1.153	1.328	1 1/2	6.011	6.738	7.651
21/32	1.151	1.271	1.465	1 5/8	7.053	7.785	8.979
11/16	1.263	1.395	1.608	1 3/4	8.181	9.043	10.41
23/32	1.380	1.524	1.757	2	10.69	11.81	13.61

For weight of brass rods multiply by 1.08

For weight of copper rods multiply by 1.13

Explanation of Wire Gauges

BROWN & SHARPE gauge is used for sheet brass, bronze and German Silver; brass, copper and German Silver wire, and brazed brass tubing.

BIRMINGHAM gauge is used for steel bands and hoops, cold rolled strip steel, cold rolled sheet copper, and seamless brass, bronze, copper and steel tubing.

WASHBURN & MOEN gauge is used for cold drawn steel wire.

STUBS' STEEL WIRE gauge is used for drill rods.

U. S. STANDARD gauge is used for hot rolled sheet steel, either plain, galvanized or tinned. Hot rolled copper sheets are made to a specified number of ounces per square foot.

MUSIC WIRE gauge is used for steel music or piano wire. The table given is for the gauge used by the American Steel & Wire Co. Several other music wire gauges are in partial use, and differ slightly from the one given.

ZINC GAUGE is used for sheet zinc and "nickeloid."

Different Standards for Wire Gauge

IN USE IN THE UNITED STATES

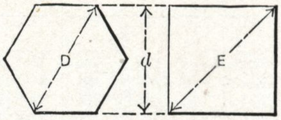
Dimensions of Sizes in Decimal Parts of an Inch

No. of Wire Gauge	Brown & Sharpe	Birmingham, or Stubs' Iron Wire	Washburn & Moen	Stubs' Steel Wire	U. S. Standard for Plate	Music Wire (A. S. & W. Co.)	Zinc Gauge
000000	.58000	....	.4615	....	.46875	.004	....
00000	.51650	.500	.4305	....	.4375	.005	....
0000	.46000	.454	.3938	....	.40625	.006	....
000	.40964	.425	.3625	....	.375	.007	....
00	.36480	.38	.3310	....	.34375	.008	....
0	.32486	.34	.3065	....	.3125	.009	....
1	.28930	.3	.2830	.227	.28125	.010	....
2	.25763	.284	.2625	.219	.265625	.011	....
3	.22942	.259	.2437	.212	.25	.012	.006
4	.20431	.238	.2253	.207	.234375	.013	.008
5	.18194	.22	.2070	.204	.21875	.014	.010
6	.16202	.203	.1920	.201	.203125	.016	.012
7	.14428	.18	.1770	.199	.1875	.018	.014
8	.12849	.165	.1620	.197	.171875	.020	.016
9	.11443	.148	.1483	.194	.15625	.022	.018
10	.10189	.134	.1350	.191	.140625	.024	.020
11	.090742	.12	.1205	.188	.125	.026	.024
12	.080808	.109	.1055	.185	.109375	.029	.028
13	.071961	.095	.0915	.182	.09375	.031	.032
14	.064084	.083	.0800	.180	.078125	.033	.036
15	.057068	.072	.0720	.178	.0703125	.035	.040
16	.050820	.065	.0625	.175	.0625	.037	.045
17	.045257	.058	.0540	.172	.05625	.039	.050
18	.040303	.049	.0475	.168	.05	.041	.055
19	.035890	.042	.0410	.164	.04375	.043	.060
20	.031961	.035	.0348	.161	.0375	.045	.070
21	.028462	.032	.03175	.157	.034375	.047	.080
22	.025347	.028	.0286	.155	.03125	.049	.090
23	.022571	.025	.0258	.153	.028125	.051	.100
24	.020100	.022	.0230	.151	.025	.055	.125
25	.017900	.02	.0204	.148	.021875	.059	....
26	.015940	.018	.0181	.146	.01875	.063	....
27	.014195	.016	.0173	.143	.0171875	.067	....
28	.012641	.014	.0162	.139	.015625	.071	....
29	.011257	.013	.0150	.134	.0140625	.075	....
30	.010025	.012	.0140	.127	.0125	.080	....
31	.008928	.01	.0132	.120	.0109375	.085	....
32	.007950	.009	.0128	.115	.01015625	.090	....
33	.007080	.008	.0118	.112	.009375	.095	....
34	.006304	.007	.0104	.110	.00859375	.098	....
35	.005614	.005	.0095	.108	.0078125	....	....
36	.005000	.004	.0090	.106	.00703125	....	....
37	.004453	....	.0085	.103	.006640625	....	....
38	.003965	....	.0080	.101	.00625	....	....
39	.003531	....	.0075	.099	....	....	....
40	.003144	....	.0070	.097	....	....	....

Circumferences and Areas of Circles

Diam.	Circumference	Area	Diam.	Circumference	Area	Diam.	Circumference	Area
1/16	0.1964	0.0031	13½	42.4115	143.14	52	163.363	2123.7
⅛	0.3927	0.0123	14	43.9823	153.94	53	166.504	2206.2
3/16	0.5890	0.0276	½	45.5331	165.13	54	169.646	2290.2
¼	0.7854	0.0491	15	47.1239	176.71	55	172.788	2375.8
5/16	0.9817	0.0767	½	48.6947	188.69	56	175.929	2463.0
⅜	1.1781	0.1105	16	50.2655	201.06	57	179.071	2551.8
7/16	1.3745	0.1503	½	51.8363	213.82	58	182.212	2642.1
½	1.5708	0.1964	17	53.4071	226.98	59	185.354	2734.0
9/16	1.7672	0.2485	½	54.9779	240.53	60	188.496	2827.4
⅝	1.9635	0.3068	18	56.5487	254.47	61	191.637	2922.5
11/16	2.1598	0.3712	½	58.1195	268.80	62	194.779	3019.1
¾	2.3562	0.4418	19	59.6903	283.53	63	197.920	3117.2
13/16	2.5525	0.5185	½	61.2611	298.65	64	201.062	3217.0
⅞	2.7489	0.6013	20	62.8319	314.16	65	204.204	3318.3
15/16	2.9452	0.6903	½	64.4026	330.06	66	207.345	3421.2
1	3.1416	0.7854	21	65.9734	346.36	67	210.487	3525.7
⅛	3.5343	0.9940	½	67.5442	363.05	68	213.628	3631.7
¼	3.9270	1.2272	22	69.1150	380.13	69	216.770	3739.3
⅜	4.3197	1.4849	½	70.6858	397.61	70	219.911	3848.5
½	4.7124	1.7671	23	72.2566	415.48	71	223.053	3959.2
⅝	5.1051	2.0739	½	73.8274	433.74	72	226.195	4071.5
¾	5.4978	2.4053	24	75.3982	452.39	73	229.336	4185.4
⅞	5.8905	2.7612	½	76.9690	471.44	74	232.478	4300.8
2	6.2832	3.1416	25	78.5398	490.87	75	235.619	4417.9
¼	7.0686	3.9761	26	81.6814	530.93	76	238.761	4536.5
½	7.8540	4.9087	27	84.8230	572.56	77	241.903	4656.6
¾	8.6394	5.9396	28	87.9646	615.75	78	245.044	4778.4
3	9.4248	7.0686	29	91.1062	660.52	79	248.186	4901.7
¼	10.2102	8.2958	30	94.2478	706.86	80	251.327	5026.5
½	10.9956	9.6211	31	97.3894	754.77	81	254.469	5153.0
¾	11.7810	11.045	32	100.531	804.25	82	257.611	5281.0
4	12.5664	12.566	33	103.673	855.30	83	260.752	5410.6
½	14.1372	15.904	34	106.814	907.92	84	263.894	5541.8
5	15.7080	19.635	35	109.956	962.11	85	267.035	5674.5
½	17.2788	23.758	36	113.097	1017.9	86	270.177	5808.8
6	18.8496	28.274	37	116.239	1075.2	87	273.319	5944.7
½	20.4204	33.183	38	119.381	1134.1	88	276.460	6082.1
7	21.9911	38.485	39	122.522	1194.6	89	279.602	6221.1
½	23.5619	44.179	40	125.664	1256.6	90	282.743	6361.7
8	25.1327	50.265	41	128.805	1320.3	91	285.885	6503.9
½	26.7035	56.745	42	131.947	1385.4	92	289.027	6647.6
9	28.2743	63.617	43	135.088	1452.2	93	292.168	6792.9
½	29.8451	70.882	44	138.230	1520.5	94	295.310	6939.8
10	31.4159	78.540	45	141.372	1590.4	95	298.451	7088.2
½	32.9867	86.590	46	144.513	1661.9	96	301.593	7238.2
11	34.5575	95.033	47	147.655	1734.9	97	304.734	7389.8
½	36.1283	103.87	48	150.796	1809.6	98	307.876	7543.0
12	37.6991	113.10	49	153.938	1885.7	99	311.018	7697.7
½	39.2699	122.72	50	157.080	1963.5	100	314.16	7854.0
13	40.8407	132.73	51	160.221	2042.8			

Distance Across Corners of Square and Hexagon



$D = 1.1547d$

$E = 1.4142d$

d	*D*	*E*	*d*	*D*	*E*	*d*	*D*	*E*
1/4	0.2886	0.3535	1 1/4	1.4434	1.7677	2 5/16	2.6702	3.2703
9/32	0.3247	0.3977	1 9/32	1.4794	1.8119	2 3/8	2.7424	3.3587
5/16	0.3608	0.4419	1 5/16	1.5155	1.8561	2 7/16	2.8145	3.4471
11/32	0.3968	0.4861	1 11/32	1.5516	1.9003	2 1/2	2.8867	3.5355
3/8	0.4329	0.5303	1 3/8	1.5877	1.9445	2 9/16	2.9589	3.6239
13/32	0.4690	0.5745	1 13/32	1.6238	1.9887	2 5/8	3.0311	3.7123
7/16	0.5051	0.6187	1 7/16	1.6598	2.0329	2 11/16	3.1032	3.8007
15/32	0.5412	0.6629	1 15/32	1.6959	2.0771	2 3/4	3.1754	3.8891
1/2	0.5773	0.7071	1 1/2	1.7320	2.1213	2 13/16	3.2476	3.9794
17/32	0.6133	0.7513	1 17/32	1.7681	2.1655	2 7/8	3.3197	4.0658
9/16	0.6494	0.7955	1 9/16	1.8042	2.2097	2 15/16	3.3919	4.1542
19/32	0.6855	0.8397	1 19/32	1.8403	2.2539	3	3.4641	4.2426
5/8	0.7216	0.8839	1 5/8	1.8764	2.2981	3 1/16	3.5362	4.3310
21/32	0.7576	0.9281	1 21/32	1.9124	2.3423	3 1/8	3.6084	4.4194
11/16	0.7937	0.9723	1 11/16	1.9485	2.3865	3 3/16	3.6806	4.5078
23/32	0.8298	1.0164	1 23/32	1.9846	2.4306	3 1/4	3.7527	4.5962
3/4	0.8659	1.0606	1 3/4	2.0207	2.4708	3 5/16	3.8249	4.6846
25/32	0.9020	1.1048	1 25/32	2.0568	2.5190	3 3/8	3.8971	4.7729
13/16	0.9380	1.1490	1 13/16	2.0929	2.5632	3 7/16	3.9692	4.8613
27/32	0.9741	1.1932	1 27/32	2.1289	2.6074	3 1/2	4.0414	4.9497
7/8	1.0102	1.2374	1 7/8	2.1650	2.6516	3 9/16	4.1136	5.0381
29/32	1.0463	1.2816	1 29/32	2.2011	2.6958	3 5/8	4.1857	5.1265
15/16	1.0824	1.3258	1 15/16	2.2372	2.7400	3 11/16	4.2579	5.2149
31/32	1.1184	1.3700	1 31/32	2.2733	2.7842	3 3/4	4.3301	5.3033
1	1.1547	1.4142	2	2.3094	2.8284	3 13/16	4.4023	5.3917
1 1/32	1.1907	1.4584	2 1/32	2.3453	2.8726	3 7/8	4.4744	5.4801
1 1/16	1.2268	1.5026	2 1/16	2.3815	2.9168	3 15/16	4.5466	5.5684
1 3/32	1.2629	1.5468	2 3/32	2.4176	2.9610	4	4.6188	5.6568
1 1/8	1.2990	1.5910	2 1/8	2.4537	3.0052	4 1/8	4.7631	5.8336
1 5/32	1.3351	1.6352	2 5/32	2.4898	3.0494	4 1/4	4.9047	6.0104
1 3/16	1.3712	1.6793	2 3/16	2.5259	3.0936	4 3/8	5.0518	6.1872
1 7/32	1.4073	1.7235	2 1/4	2.5981	3.1820	4 1/2	5.1961	6.3639

Squares, Cubes, Square and Cube Roots

of Numbers from 1 to 100

No.	Square	Cube	Square Root	Cube Root	No.	Square	Cube	Square Root	Cube Root
1	1	1	1.0000	1.0000	51	2601	132651	7.1414	3.7084
2	4	8	1.4142	1.2599	52	2704	140608	7.2111	3.7325
3	9	27	1.7321	1.4422	53	2809	148877	7.2801	3.7563
4	16	64	2.0000	1.5874	54	2916	157464	7.3485	3.7798
5	25	125	2.2361	1.7100	55	3025	166375	7.4162	3.8030
6	36	216	2.4495	1.8171	56	3136	175616	7.4833	3.8259
7	49	343	2.6458	1.9129	57	3249	185193	7.5498	3.8485
8	64	512	2.8284	2.0000	58	3364	195112	7.6158	3.8709
9	81	729	3.0000	2.0801	59	3481	205379	7.6811	3.8930
10	100	1000	3.1623	2.1544	60	3600	216000	7.7460	3.9149
11	121	1331	3.3166	2.2240	61	3721	226981	7.8102	3.9365
12	144	1728	3.4641	2.2894	62	3844	238328	7.8740	3.9579
13	169	2197	3.6056	2.3513	63	3969	250047	7.9373	3.9791
14	196	2744	3.7417	2.4101	64	4096	262144	8.0000	4.0000
15	225	3375	3.8730	2.4662	65	4225	274625	8.0623	4.0207
16	256	4096	4.0000	2.5198	66	4356	287496	8.1240	4.0412
17	289	4913	4.1231	2.5713	67	4489	300763	8.1854	4.0615
18	324	5832	4.2426	2.6207	68	4624	314432	8.2462	4.0817
19	361	6859	4.3589	2.6684	69	4761	328509	8.3066	4.1016
20	400	8000	4.4721	2.7144	70	4900	343000	8.3666	4.1213
21	441	9261	4.5826	2.7589	71	5041	357911	8.4261	4.1408
22	484	10648	4.6904	2.8020	72	5184	373248	8.4853	4.1602
23	529	12167	4.7958	2.8439	73	5329	389017	8.5440	4.1793
24	576	13824	4.8990	2.8845	74	5476	405224	8.6023	4.1983
25	625	15625	5.0000	2.9240	75	5625	421875	8.6603	4.2172
26	676	17576	5.0990	2.9625	76	5776	438976	8.7178	4.2358
27	729	19683	5.1962	3.0000	77	5929	456533	8.7750	4.2543
28	784	21952	5.2915	3.0366	78	6084	474552	8.8318	4.2727
29	841	24389	5.3852	3.0723	79	6241	493039	8.8882	4.2908
30	900	27000	5.4772	3.1072	80	6400	512000	8.9443	4.3089
31	961	29791	5.5678	3.1414	81	6561	531441	9.0000	4.3267
32	1024	32768	5.6569	3.1748	82	6724	551368	9.0554	4.3445
33	1089	35937	5.7446	3.2075	83	6889	571787	9.1104	4.3621
34	1156	39304	5.8310	3.2396	84	7056	592704	9.1652	4.3795
35	1225	42875	5.9161	3.2711	85	7225	614125	9.2195	4.3968
36	1296	46656	6.0000	3.3019	86	7396	636056	9.2736	4.4140
37	1369	50653	6.0828	3.3322	87	7569	658503	9.3276	4.4310
38	1444	54872	6.1644	3.3620	88	7744	681472	9.3808	4.4480
39	1521	59319	6.2450	3.3912	89	7921	704969	9.4340	4.4647
40	1600	64000	6.3246	3.4200	90	8100	729000	9.4868	4.4814
41	1681	68921	6.4031	3.4482	91	8281	753571	9.5394	4.4979
42	1764	74088	6.4807	3.4760	92	8464	778688	9.5917	4.5144
43	1849	79507	6.5574	3.5034	93	8649	804357	9.6437	4.5307
44	1936	85184	6.6332	3.5303	94	8836	830584	9.6954	4.5468
45	2025	91125	6.7082	3.5569	95	9025	857375	9.7468	4.5629
46	2116	97336	6.7823	3.5830	96	9216	884736	9.7980	4.5789
47	2209	103823	6.8557	3.6088	97	9409	912673	9.8489	4.5947
48	2304	110592	6.9282	3.6342	98	9604	941191	9.8995	4.6104
49	2401	117649	7.0000	3.6593	99	9801	970299	9.9499	4.6261
50	2500	125000	7.0711	3.6840	100	10000	1000000	10.0000	4.6416

Reciprocals of Numbers

From 1 to 200

No.	Reciprocal	No.	Reciprocal	No.	Reciprocal	No.	Reciprocal
1	1.00000000	51	.01960784	101	.00990099	151	.00662252
2	.50000000	52	.01923077	102	.00980392	152	.00657895
3	.33333333	53	.01886792	103	.00970874	153	.00653595
4	.25000000	54	.01851852	104	.00961538	154	.00649351
5	.20000000	55	.01818182	105	.00952381	155	.00645161
6	.16666667	56	.01785714	106	.00943396	156	.00641026
7	.14285714	57	.01754386	107	.00934579	157	.00636943
8	.12500000	58	.01724138	108	.00925926	158	.00632911
9	.11111111	59	.01694915	109	.00917431	159	.00628931
10	.10000000	60	.01666667	110	.00909091	160	.00625000
11	.09090909	61	.01639344	111	.00900901	161	.00621118
12	.08333333	62	.01612903	112	.00892857	162	.00617284
13	.07692308	63	.01587302	113	.00884956	163	.00613497
14	.07142857	64	.01562500	114	.00877193	164	.00609756
15	.06666667	65	.01538461	115	.00869565	165	.00606061
16	.06250000	66	.01515151	116	.00862069	166	.00602410
17	.05882353	67	.01492537	117	.00854701	167	.00598802
18	.05555556	68	.01470588	118	.00847458	168	.00595238
19	.05263158	69	.01449275	119	.00840336	169	.00591716
20	.05000000	70	.01428571	120	.00833333	170	.00588235
21	.04761905	71	.01408451	121	.00826446	171	.00584795
22	.04545455	72	.01388889	122	.00819672	172	.00581395
23	.04347826	73	.01369863	123	.00813008	173	.00578035
24	.04166667	74	.01351351	124	.00806452	174	.00574713
25	.04000000	75	.01333333	125	.00800000	175	.00571429
26	.03846154	76	.01315789	126	.00793651	176	.00568182
27	.03703704	77	.01298701	127	.00787402	177	.00564972
28	.03571429	78	.01282051	128	.00781250	178	.00561798
29	.03448276	79	.01265823	129	.00775194	179	.00558659
30	.03333333	80	.01250000	130	.00769231	180	.00555556
31	.03225806	81	.01234568	131	.00763359	181	.00552486
32	.03125000	82	.01219512	132	.00757576	182	.00549451
33	.03030303	83	.01204819	133	.00751880	183	.00546448
34	.02941176	84	.01190476	134	.00746269	184	.00543478
35	.02857143	85	.01176471	135	.00740741	185	.00540540
36	.02777778	86	.01162791	136	.00735294	186	.00537634
37	.02702703	87	.01149425	137	.00729927	187	.00534759
38	.02631579	88	.01136364	138	.00724638	188	.00531914
39	.02564103	89	.01123595	139	.00719424	189	.00529100
40	.02500000	90	.01111111	140	.00714286	190	.00526316
41	.02439024	91	.01098901	141	.00709220	191	.00523560
42	.02380952	92	.01086956	142	.00704225	192	.00520833
43	.02325581	93	.01075269	143	.00699301	193	.00518135
44	.02272727	94	.01063830	144	.00694444	194	.00515464
45	.02222222	95	.01052632	145	.00689655	195	.00512820
46	.02173913	96	.01041667	146	.00684931	196	.00510204
47	.02127660	97	.01030928	147	.00680272	197	.00507614
48	.02083333	98	.01020408	148	.00675676	198	.00505051
49	.02040816	99	.01010101	149	.00671141	199	.00502513
50	.02000000	100	.01000000	150	.00666667	200	.00500000

Natural Tangents and Cotangents

Degrees	TANGENT							
	0′	10′	20′	30′	40′	50′	60′	
0	0.00000	0.00291	0.00582	0.00873	0.01164	0.01455	0.01746	89
1	0.01746	0.02036	0.02328	0.02619	0.02910	0.03201	0.03492	88
2	0.03492	0.03783	0.04075	0.04366	0.04658	0.04949	0.05241	87
3	0.05241	0.05533	0.05824	0.06116	0.06408	0.06700	0.06993	86
4	0.06993	0.07285	0.07578	0.07870	0.08163	0.08456	0.08749	85
5	0.08749	0.09042	0.09335	0.09629	0.09923	0.10216	0.10510	84
6	0.10510	0.10805	0.11099	0.11394	0.11688	0.11983	0.12278	83
7	0.12278	0.12574	0.12869	0.13165	0.13461	0.13758	0.14054	82
8	0.14054	0.14351	0.14648	0.14945	0.15243	0.15540	0.15838	81
9	0.15838	0.16137	0.16435	0.16734	0.17033	0.17333	0.17633	80
10	0.17633	0.17933	0.18233	0.18534	0.18835	0.19136	0.19438	79
11	0.19438	0.19740	0.20042	0.20345	0.20648	0.20952	0.21256	78
12	0.21256	0.21560	0.21864	0.22169	0 22475	0.22781	0.23087	77
13	0.23087	0.23393	0.23700	0.24008	0.24316	0.24624	0.24933	76
14	0.24933	0.25242	0.25552	0.25862	0.26172	0.26483	0.26795	75
15	0.26795	0.27107	0.27419	0.27732	0.28046	0.28360	0.28675	74
16	0.28675	0.28990	0.29305	0.29621	0.29938	0.30255	0.30573	73
17	0.30573	0.30891	0.31210	0.31530	0.31850	0.32171	0.32492	72
18	0.32492	0.32814	0.33136	0.33460	0.33783	0.34108	0.34433	71
19	0.34433	0.34758	0.35085	0.35412	0.35740	0.36068	0.36397	70
20	0.36397	0.36727	0.37057	0.37388	0.37720	0.38053	0.38386	69
21	0.38386	0.38721	0.39055	0.39391	0.39727	0.40065	0.40403	68
22	0.40403	0.40741	0.41081	0.41421	0.41763	0.42105	0.42447	67
23	0.42447	0.42791	0.43136	0.43481	0.43828	0.44175	0.44523	66
24	0.44523	0.44872	0.45222	0.45573	0.45924	0.46277	0.46631	65
25	0.46631	0.46985	0.47341	0.47698	0.48055	0.48414	0.48773	64
26	0.48773	0.49134	0.49495	0.49858	0.50222	0.50587	0.50953	63
27	0.50953	0.51320	0.51688	0.52057	0.52427	0.52798	0.53171	62
28	0.53171	0.53545	0.53920	0.54296	0.54674	0.55051	0.55431	61
29	0.55431	0.55812	0.56194	0.56577	0.56962	0.57348	0.57735	60
30	0.57735	0.58124	0.58513	0.58905	0.59297	0.59691	0.60086	59
31	0.60086	0.60483	0.60881	0.61280	0.61681	0.62083	0.62487	58
32	0.62487	0.62892	0.63299	0.63707	0.64117	0.64528	0.64941	57
33	0.64941	0.65355	0.65771	0.66189	0.66608	0.67028	0.67451	56
34	0.67451	0.67875	0.68301	0.68728	0.69157	0.69588	0.70021	55
35	0.70021	0.70455	0.70891	0.71329	0.71769	0.72211	0.72654	54
36	0.72654	0.73100	0.73547	0.73996	0.74447	0.74900	0.75355	53
37	0.75355	0.75812	0.76272	0.76733	0.77196	0.77661	0.78129	52
38	0.78129	0.78598	0.79070	0.79544	0.80020	0.80498	0.80978	51
39	0.80978	0.81461	0.81946	0.82434	0.82923	0.83415	0.83910	50
40	0.83910	0.84407	0.84906	0.85408	0.85912	0.86419	0.86929	49
41	0.86929	0.87441	0.87955	0.88473	0.88992	0.89515	0.90040	48
42	0.90040	0.90569	0.91099	0.91633	0.92170	0.92709	0.93252	47
43	0.93252	0.93797	0.94345	0.94896	0.95451	0.96008	0.96569	46
44	0.96569	0.97133	0.97700	0.98270	0.98843	0.99420	1.00000	45
	60′	50′	40′	30′	20′	10′	0′	Degrees
	COTANGENT							

Natural Cotangents and Tangents

Degrees	COTANGENT							
	0′	10′	20′	30′	40′	50′	60′	
0	00.00000	343.77371	171.88540	114.58865	85.93979	68.75009	57.28996	89
1	57.28996	49.10388	42.96408	38.18846	34.36777	31.24158	28.63625	88
2	28.63625	26.43160	24.54176	22.90377	21.47040	20.20555	19.08114	87
3	19.08114	18.07498	17.16934	16.34986	15.60478	14.92442	14.30067	86
4	14.30067	13.72674	13.19688	12.70621	12.25051	11.82617	11.43005	85
5	11.43005	11.05943	10.71191	10.38540	10.07803	9.78817	9.51436	84
6	9.51436	9.25530	9.00983	8.77689	8.55555	8.34496	8.14435	83
7	8.14435	7.95302	7.77035	7.59575	7.42871	7.26873	7.11537	82
8	7.11537	6.96823	6.82694	6.69116	6.56055	6.43484	6.31375	81
9	6.31375	6.19703	6.08444	5.97576	5.87080	5.76937	5.67128	80
10	5.67128	5.57638	5.48451	5.39552	5.30928	5.22566	5.14455	79
11	5.14455	5.06584	4.98940	4.91516	4.84300	4.77286	4.70463	78
12	4.70463	4.63825	4.57363	4.51071	4.44942	4.38969	4.33148	77
13	4.33148	4.27471	4.21933	4.16530	4.11256	4.06107	4.01078	76
14	4.01078	3.96165	3.91364	3.86671	3.82083	3.77595	3.73205	75
15	3.73205	3.68909	3.64705	3.60588	3.56557	3.52609	3.48741	74
16	3.48741	3.44951	3.41236	3.37594	3.34023	3.30521	3.27085	73
17	3.27085	3.23714	3.20406	3.17159	3.13972	3.10842	3.07768	72
18	3.07768	3.04749	3.01783	2.98869	2.96004	2.93189	2.90421	71
19	2.90421	2.87700	2.85023	2.82391	2.79802	2.77254	2.74748	70
20	2.74748	2.72281	2.69853	2.67462	2.65109	2.62791	2.60509	69
21	2.60509	2.58261	2.56046	2.53865	2.51715	2.49597	2.47509	68
22	2.47509	2.45451	2.43422	2.41421	2.39449	2.37504	2.35585	67
23	2.35585	2.33693	2.31826	2.29984	2.28167	2.26374	2.24604	66
24	2.24604	2.22857	2.21132	2.19430	2.17749	2.16090	2.14451	65
25	2.14451	2.12832	2.11233	2.09654	2.08094	2.06553	2.05030	64
26	2.05030	2.03526	2.02039	2.00569	1.99116	1.97680	1.96261	63
27	1.96261	1.94858	1.93470	1.92098	1.90741	1.89400	1.88073	62
28	1.88073	1.86760	1.85462	1.84177	1.82907	1.81649	1.80405	61
29	1.80405	1.79174	1.77955	1.76749	1.75556	1.74375	1.73205	60
30	1.73205	1.72047	1.70901	1.69766	1.68643	1.67530	1.66428	59
31	1.66428	1.65337	1.64256	1.63185	1.62125	1.61074	1.60033	58
32	1.60033	1.59002	1.57981	1.56969	1.55966	1.54972	1.53987	57
33	1.53987	1.53010	1.52043	1.51084	1.50133	1.49190	1.48256	56
34	1.48256	1.47330	1.46411	1.45501	1.44598	1.43703	1.42815	55
35	1.42815	1.41934	1.41061	1.40195	1.39336	1.38484	1.37638	54
36	1.37638	1.36800	1.35968	1.35142	1.34323	1.33511	1.32704	53
37	1.32704	1.31904	1.31110	1.30323	1.29541	1.28764	1.27994	52
38	1.27994	1.27230	1.26471	1.25717	1.24969	1.24227	1.23490	51
39	1.23490	1.22758	1.22031	1.21310	1.20593	1.19882	1.19175	50
40	1.19175	1.18474	1.17777	1.17085	1.16398	1.15715	1.15037	49
41	1.15037	1.14363	1.13694	1.13029	1.12369	1.11713	1.11061	48
42	1.11061	1.10414	1.09770	1.09131	1.08496	1.07864	1.07237	47
43	1.07237	1.06613	1.05994	1.05378	1.04766	1.04158	1.03553	46
44	1.03553	1.02952	1.02355	1.01761	1.01170	1.00583	1.00000	45
	60′	50′	40′	30′	20′	10′	0′	Degrees
	TANGENT							

Natural Sines and Cosines

Degrees	SINE							
	0′	10′	20′	30′	40′	50′	60′	
0	0.00000	0.00291	0.00582	0.00873	0.01164	0.01454	0.01745	89
1	0.01745	0.02036	0.02327	0.02618	0.02908	0.03199	0.03490	88
2	0.03490	0.03781	0.04071	0.04362	0.04653	0.04943	0.05234	87
3	0.05234	0.05524	0.05814	0.06105	0.06395	0.06685	0.06976	86
4	0.06976	0.07266	0.07556	0.07846	0.08136	0.08426	0.08716	85
5	0.08716	0.09005	0.09295	0.09585	0.09874	0.10164	0.10453	84
6	0.10453	0.10742	0.11031	0.11320	0.11609	0.11898	0.12187	83
7	0.12187	0.12476	0.12764	0.13053	0.13341	0.13629	0.13917	82
8	0.13917	0.14205	0.14493	0.14781	0.15069	0.15356	0.15643	81
9	0.15643	0.15931	0.16218	0.16505	0.16792	0.17078	0.17365	80
10	0.17365	0.17651	0.17937	0.18224	0.18500	0.18795	0.19081	79
11	0.19081	0.19366	0.19652	0.19937	0.20222	0.20507	0.20791	78
12	0.20791	0.21076	0.21360	0.21644	0.21928	0.22212	0.22495	77
13	0.22495	0.22778	0.23062	0.23345	0.23627	0.23910	0.24192	76
14	0.24192	0.24474	0.24756	0.25038	0.25320	0.25601	0.25882	75
15	0.25882	0.26163	0.26443	0.26724	0.27004	0.27284	0.27564	74
16	0.27564	0.27843	0.28123	0.28402	0.28680	0.28959	0.29237	73
17	0.29237	0.29515	0.29793	0.30071	0.30348	0.30625	0.30902	72
18	0.30902	0.31178	0.31454	0.31730	0.32006	0.32282	0.32557	71
19	0.32557	0.32832	0.33106	0.33381	0.33655	0.33929	0.34202	70
20	0.34202	0.34475	0.34748	0.35021	0.35293	0.35565	0.35837	69
21	0.35837	0.36108	0.36379	0.36650	0.36921	0.37191	0.37461	68
22	0.37461	0.37730	0.37999	0.38268	0.38537	0.38805	0.39073	67
23	0.39073	0.39341	0.39608	0.39875	0.40142	0.40408	0.40674	66
24	0.40674	0.40939	0.41204	0.41469	0.41734	0.41998	0.42262	65
25	0.42262	0.42525	0.42788	0.43051	0.43318	0.43575	0.43837	64
26	0.43837	0.44098	0.44359	0.44620	0.44880	0.45140	0.45399	63
27	0.45399	0.45658	0.45917	0.46175	0.46433	0.46690	0.46947	62
28	0.46947	0.47204	0.47460	0.47716	0.47971	0.48226	0.48481	61
29	0.48481	0.48735	0.48989	0.49242	0.49495	0.49748	0.50000	60
30	0.50000	0.50252	0.50503	0.50754	0.51004	0.51254	0.51504	59
31	0.51504	0.51753	0.52002	0.52250	0.52498	0.52745	0.52992	58
32	0.52992	0.53238	0.53484	0.53730	0.53975	0.54220	0.54464	57
33	0.54464	0.54708	0.54951	0.55194	0.55436	0.55678	0.55919	56
34	0.55919	0.56160	0.56401	0.56641	0.56880	0.57119	0.57358	55
35	0.57358	0.57596	0.57833	0.58070	0.58307	0.58543	0.58779	54
36	0.58779	0.59014	0.59248	0.59482	0.59716	0.59949	0.60182	53
37	0.60182	0.60414	0.60645	0.60876	0.61107	0.61337	0.61566	52
38	0.61566	0.61795	0.62024	0.62251	0.62479	0.62706	0.62932	51
39	0.62932	0.63158	0.63383	0.63608	0.63832	0.64056	0.64279	50
40	0.64279	0.64501	0.64723	0.64945	0.65166	0.65386	0.65606	49
41	0.65606	0.65825	0.66044	0.66262	0.66480	0.66697	0.66913	48
42	0.66913	0.67129	0.67344	0.67559	0.67773	0.67987	0.68200	47
43	0.68200	0.68412	0.68624	0.68835	0.69046	0.69256	0.69466	46
44	0.69466	0.69675	0.69883	0.70091	0.70298	0.70505	0.70711	45
	60′	50′	40′	30′	20′	10′	0′	Degrees
	COSINE							

Natural Cosines and Sines

Degrees	COSINE							
	0′	10′	20′	30′	40′	50′	60′	
0	1.00000	1.00000	0.99998	0.99996	0.99993	0.99989	0.99985	89
1	0.99985	0.99979	0.99973	0.99966	0.99958	0.99949	0.99939	88
2	0.99939	0.99929	0.99917	0.99905	0.99892	0.99878	0.99863	87
3	0.99863	0.99847	0.99831	0.99813	0.99795	0.99776	0.99756	86
4	0.99756	0.99736	0.99714	0.99692	0.99668	0.99644	0.99619	85
5	0.99619	0.99594	0.99567	0.99540	0.99511	0.99482	0.99452	84
6	0.99452	0.99421	0.99390	0.99357	0.99324	0.99290	0.99255	83
7	0.99255	0.99219	0.99182	0.99144	0.99106	0.99067	0.99027	82
8	0.99027	0.98986	0.98944	0.98902	0.98858	0.98814	0.98769	81
9	0.98769	0.98723	0.98676	0.98629	0.98580	0.98531	0.98481	80
10	0.98481	0.98430	0.98378	0.98325	0.98272	0.98218	0.98163	79
11	0.98163	0.98107	0.98050	0.97992	0.97934	0.97875	0.97815	78
12	0.97815	0.97754	0.97692	0.97630	0.97566	0.97502	0.97437	77
13	0.97437	0.97371	0.97304	0.97237	0.97169	0.97100	0.97030	76
14	0.97030	0.96959	0.96887	0.96815	0.96742	0.96667	0.96593	75
15	0.96593	0.96517	0.96440	0.96363	0.96285	0.96206	0.96126	74
16	0.96126	0.96046	0.95964	0.95882	0.95799	0.95715	0.95630	73
17	0.95630	0.95545	0.95459	0.95372	0.95284	0.95195	0.95106	72
18	0.95106	0.95015	0.94924	0.94832	0.94740	0.94646	0.94552	71
19	0.94552	0.94457	0.94361	0.94264	0.94167	0.94068	0.93969	70
20	0.93969	0.93869	0.93769	0.93667	0.93565	0.93462	0.93358	69
21	0.93358	0.93253	0.93148	0.93042	0.92935	0.92827	0.92718	68
22	0.92718	0.92609	0.92499	0.92388	0.92276	0.92164	0.92050	67
23	0.92050	0.91936	0 91822	0.91706	0.91590	0.91472	0.91355	66
24	0.91355	0.91236	0.91116	0.90996	0.90875	0.90753	0.90631	65
25	0.90631	0.90507	0.90383	0.90259	0.90133	0.90007	0.89879	64
26	0.89879	0.89752	0.89623	0.89493	0.89363	0.89232	0.89101	63
27	0.89101	0.88968	0.88835	0.88701	0.88566	0.88431	0.88295	62
28	0.88295	0.88158	0.88020	0.87882	0.87743	0.87603	0.87462	61
29	0.87462	0.87321	0.87178	0.87036	0.86892	0.86748	0.86603	60
30	0.86603	0.86457	0.86310	0.86163	0.86115	0.85866	0.85717	59
31	0.85717	0.85567	0.85416	0.85264	0.85112	0.84959	0.84805	58
32	0.84805	0.84650	0.84495	0.84339	0.84182	0.84025	0.83867	57
33	0.83867	0.83708	0.83549	0.83389	0.83228	0.83066	0.82904	56
34	0.82904	0.82741	0.82577	0.82413	0.82248	0.82082	0.81915	55
35	0.81915	0.81748	0.81580	0.81412	0.81242	0.81072	0.80902	54
36	0.80902	0.80730	0.80558	0.80386	0.80212	0.80038	0.79864	53
37	0.79864	0.79688	0.79512	0.79335	0.79158	0.78980	0.78801	52
38	0.78801	0.78622	0.78442	0.78261	0.78079	0.77897	0.77715	51
39	0.77715	0.77531	0.77347	0.77162	0.76977	0.76791	0.76604	50
40	0.76604	0.76417	0.76229	0.76041	0.75851	0.75661	0.75471	49
41	0.75471	0.75280	0.75088	0.74896	0.74703	0.74509	0.74314	48
42	0.74314	0.74120	0.73924	0.73728	0.73531	0.73333	0.73135	47
43	0.73135	0.72937	0.72737	0.72537	0.72337	0.72136	0.71934	46
44	0.71934	0.71732	0.71529	0.71325	0.71121	0.70916	0.70711	45
	60′	50′	40′	30′	20′	10′	0′	Degrees
	SINE							

Decimal Equivalents of Millimeters

M/m	Inches	M/m	Inches	M/m	Inches	M/m	Inches
.1	.00394	4.1	.16141	8.1	.31889	12.1	.47637
.2	.00787	4.2	.16535	8.2	.32283	12.2	.48031
.3	.01181	4.3	.16929	8.3	.32677	12.3	.48425
.4	.01575	4.4	.17322	8.4	.33070	12.4	.48818
.5	.01968	4.5	.17716	8.5	.33464	12.5	.49212
.6	.02362	4.6	.18110	8.6	.33858	12.6	.49606
.7	.02756	4.7	.18503	8.7	.34251	12.7	.49999
.8	.03149	4.8	.18897	8.8	.34645	12.8	.50393
.9	.03543	4.9	.19291	8.9	.35039	12.9	.50787
1.	.03937	5.	.19685	9.	.35433	13.	.51181
1.1	.04330	5.1	.20078	9.1	.35826	13.1	.51574
1.2	.04724	5.2	.20472	9.2	.36220	13.2	.51968
1.3	.05118	5.3	.20866	9.3	.36614	13.3	.52362
1.4	.05512	5.4	.21259	9.4	.37007	13.4	.52755
1.5	.05905	5.5	.21653	9.5	.37401	13.5	.53149
1.6	.06299	5.6	.22047	9.6	.37795	13.6	.53543
1.7	.06692	5.7	.22440	9.7	.38188	13.7	.53936
1.8	.07086	5.8	.22834	9.8	.38582	13.8	.54330
1.9	.07480	5.9	.23228	9.9	.38976	13.9	.54724
2.	.07874	6.	.23622	10.	.39370	14.	.55118
2.1	.08267	6.1	.24015	10.1	.39763	14.1	.55511
2.2	.08661	6.2	.24409	10.2	.40157	14.2	.55905
2.3	.09055	6.3	.24803	10.3	.40551	14.3	.56299
2.4	.09448	6.4	.25196	10.4	.40944	14.4	.56692
2.5	.09842	6.5	.25590	10.5	.41338	14.5	.57086
2.6	.10236	6.6	.25984	10.6	.41732	14.6	.57480
2.7	.10629	6.7	.26377	10.7	.42125	14.7	.57873
2.8	.11023	6.8	.26771	10.8	.42519	14.8	.58267
2.9	.11417	6.9	.27165	10.9	.42913	14.9	.58661
3.	.11811	7.	.27559	11.	.43307	15.	.59055
3.1	.12204	7.1	.27952	11.1	.43700	15.5	.61023
3.2	.12598	7.2	.28346	11.2	.44094	16.	.62992
3.3	.12992	7.3	.28740	11.3	.44488	16.5	.64960
3.4	.13385	7.4	.29133	11.4	.44881	17.	.66929
3.5	.13779	7.5	.29527	11.5	.45275	17.5	.68897
3.6	.14173	7.6	.29921	11.6	.45669	18.	.70866
3.7	.14566	7.7	.30314	11.7	.46062	18.5	.72834
3.8	.14960	7.8	.30708	11.8	.46456	19.	.74803
3.9	.15354	7.9	.31102	11.9	.46850	19.5	.76771
4.	.15748	8.	.31496	12.	.47244	20.	.78740

(List concluded on following page)

Decimal Equivalents of Millimeters

(Concluded)

M/m	Inches	M/m	Inches	M/m	Inches	M/m	Inches
20.5	.80708	40.5	1.59448	60.5	2.38188	80.5	3.16928
21.	.82677	41.	1.61417	61.	2.40157	81.	3.18897
21.5	.84645	41.5	1.63385	61.5	2.42125	81.5	3.20865
22.	.86614	42.	1.65354	62.	2.44094	82.	3.22834
22.5	.88582	42.5	1.67322	62.5	2.46062	82.5	3.24802
23.	.90551	43.	1.69291	63.	2.48031	83.	3.26771
23.5	.92519	43.5	1.71259	63.5	2.49999	83.5	3.28739
24.	.94488	44.	1.73228	64.	2.51968	84.	3.30708
24.5	.96456	44.5	1.75196	64.5	2.53936	84.5	3.32676
25.	.98425	45.	1.77165	65.	2.55905	85.	3.34645
25.5	1.00393	45.5	1.79133	65.5	2.57873	85.5	3.36613
26.	1.02362	46.	1.81102	66.	2.59842	86.	3.38582
26.5	1.04330	46.5	1.83070	66.5	2.61810	86.5	3.40550
27.	1.06299	47.	1.85039	67.	2.63779	87.	3.42519
27.5	1.08267	47.5	1.87007	67.5	2.65747	87.5	3.44487
28.	1.10236	48.	1.88976	68.	2.67716	88.	3.46456
28.5	1.12204	48.5	1.90944	68.5	2.69684	88.5	3.48424
29.	1.14173	49.	1.92913	69.	2.71653	89.	3.50393
29.5	1.16141	49.5	1.94881	69.5	2.73621	89.5	3.52361
30.	1.18110	50.	1.96850	70.	2.75590	90.	3.54330
30.5	1.20078	50.5	1.98818	70.5	2.77558	90.5	3.56298
31.	1.22047	51.	2.00787	71.	2.79527	91.	3.58267
31.5	1.24015	51.5	2.02755	71.5	2.81495	91.5	3.60235
32.	1.25984	52.	2.04724	72.	2.83464	92.	3.62204
32.5	1.27952	52.5	2.06692	72.5	2.85432	92.5	3.64172
33.	1.29921	53.	2.08661	73.	2.87401	93.	3.66141
33.5	1.31889	53.5	2.10629	73.5	2.89369	93.5	3.68109
34.	1.33858	54.	2.12598	74.	2.91338	94.	3.70078
34.5	1.35826	54.5	2.14566	74.5	2.93306	94.5	3.72046
35.	1.37795	55.	2.16535	75.	2.95275	95.	3.74015
35.5	1.39763	55.5	2.18503	75.5	2.97243	95.5	3.75983
36.	1.41732	56.	2.20472	76.	2.99212	96.	3.77952
36.5	1.43700	56.5	2.22440	76.5	3.01180	96.5	3.79920
37.	1.45669	57.	2.24409	77.	3.03149	97.	3.81889
37.5	1.47637	57.5	2.26377	77.5	3.05117	97.5	3.83857
38.	1.49606	58.	2.28346	78.	3.07086	98.	3.85826
38.5	1.51574	58.5	2.30314	78.5	3.09054	98.5	3.87794
39.	1.53543	59.	2.32283	79.	3.11023	99.	3.89763
39.5	1.55511	59.5	2.34251	79.5	3.12991	99.5	3.91731
40.	1.57480	60.	2.36220	80.	3.14960	100.	3.93700

Metric Conversion Tables

U. S. to Metric

LINEAR

1 inch = 25.4001 millimeters.
1 foot = 0.304801 meters.
1 yard = 0.914402 meters.
1 mile = 1.60935 kilometers.

SQUARE

1 square inch = 6.452 square centimeters.
1 square foot = 9.290 square decimeters.
1 square yard = 0.836 square meters.

CUBIC

~~1.8~~ ozs. → 1 cubic inch = 16.387 cubic centimeters.
1.7
1 cubic foot = 0.02832 cubic meters.
1 cubic yard = 0.765 cubic meters.

29.5 CC = 1 oz.
~~1.8ozs~~ = one C.I.
1.7 CI = 1 onz

WEIGHT

1 grain = 64.7989 milligrammes.
1 avoirdupois ounce = 28.3495 grammes.
1 troy ounce = 31.10348 grammes.
1 avoirdupois pound = 0.45359 kilogrammes.

CAPACITY

1 fluid drachm = 3.70 cubic centimeters.
1 fluid ounce = 29.57 milliliters.
1 quart = 0.94636 liters.
1 gallon = 3.78544 liters.

Metric to U. S.

LINEAR

1 meter = 39.3700 inches.
1 meter = 3.28083 feet.
1 meter = 1.09361 yards.
1 kilometer = 0.62137 miles.

SQUARE

1 square centimeter = 0.1550 square inches.
1 square meter = 10.7640 square feet.
1 square meter = 1.196 square yards.

CUBIC

1 cubic centimeter = 0.0610 cubic inches.
1 cubic meter = 35.314 cubic feet.
1 cubic meter = 1.308 cubic yards.

WEIGHT

1 milligramme = 0.01543 grains.
1 kilogramme = 15432.36 grains.
1 hectogramme = 3.5274 avoirdupois ounces.
1 kilogramme = 2.20462 avoirdupois pounds.

CAPACITY

1 milliliter = 0.27 fluid drachms.
1 centiliter = 0.338 fluid ounces.
1 liter = 1.0567 quarts.
1 dekaliter = 2.6417 gallons.

Weights and Measures

Measures of Length.

1 mile = 1760 yards = 5280 feet.
1 yard = 3 feet = 36 inches.
1 foot = 12 inches.
The following measures of length are also used occasionally:
1 mil = 0.001 inch. 1 fathom = 2 yards = 6 feet.
1 rod = 5.5 yards = 16.5 feet. 1 hand = 4 inches. 1 span = 9 inches.

Surveyor's Measure.

1 mile = 8 furlongs = 80 chains.
1 furlong = 10 chains = 220 yards.
1 chain = 4 rods = 22 yards = 66 feet = 100 links.
1 link = 7.92 inches.

Nautical Measure.

1 league = 3 nautical miles.
1 nautical mile (knot) = 6080.26 feet = 1.1516 statute mile.
One degree at the equator = 60 nautical miles = 69.168 statute miles.
360 degrees = 21,600 nautical miles = 24,874.5 statute miles = circumference of earth at the equator.

Square Measure.

1 square mile = 640 acres = 6400 square chains.
1 acre = 10 square chains = 4840 square yards = 43,560 square feet.
1 square chain = 16 square rods = 484 square yards = 4356 square feet.
1 square rod = 30.25 square yards = 272.25 square feet = 625 square links.
1 square yard = 9 square feet.
1 square foot = 144 square inches.
An acre is equal to a square, the side of which is 208.7 feet.

Measure used for Diameters and Areas of Electric Wires.

1 circular inch = area of circle 1 inch in diameter = 0.7854 square inch.
1 circular inch = 1,000,000 circular mils.
1 square inch = 1.2732 circular inch = 1,273,239 circular mils.
A circular mil is the area of a circle 0.001 inch in diameter.

Cubic Measure.

1 cubic yard = 27 cubic feet.
1 cubic foot = 1728 cubic inches.
The following measures are also used for wood and masonry:
1 cord of wood = 4 x 4 x 8 feet = 128 cubic feet.
1 perch of masonry = 16½ x 1½ x 1 foot = 24¾ cubic feet.

Shipping Measure.

For measuring entire internal capacity of a vessel:
  1 register ton = 100 cubic feet.

For measurement of cargo:
  1 U.S. shipping ton = 40 cubic feet = 32.143 U.S. bushels = 31.16 Imperial bushels.
  1 British shipping ton = 42 cubic feet = 33.75 U.S. bushels = 32.72 Imperial bushels.

Dry Measure

1 bushel (U. S. or Winchester struck bushel) = 1.2445 cubic foot = 2150.42 cubic inches.
1 bushel = 4 pecks = 32 quarts = 64 pints.
1 peck = 8 quarts = 16 pints.
1 quart = 2 pints.

1 heaped bushel = 1¼ struck bushel.
1 cubic foot = 0.8036 struck bushel.
1 British Imperial bushel = 8 Imperial gallons = 1.2837 cubic foot = 2218.19 cubic inches.

Liquid Measure

1 U. S. Gallon = 0.1337 cubic foot = 231 cubic inches = 4 quarts = 8 pints.
1 quart = 2 pints = 8 gills.
1 pint = 4 gills.
1 British Imperial gallon = 1.2003 U. S. gallon = 277.27 cubic inches.
1 cubic foot = 7.48 U. S. gallons.

Old Liquid Measure

1 tun = 2 pipes = 3 puncheons.
1 pipe or butt = 2 hogsheads = 4 barrels = 126 gallons.
1 puncheon = 2 tierces = 84 gallons.
1 hogshead = 2 barrels = 63 gallons.
1 tierce = 42 gallons.
1 barrel = 31½ gallons.

Apothecaries' Fluid Measure

1 U. S. fluid ounce—8 drachms = 1.805 cubic inch = 1/128 U. S. gallon.
1 fluid drachm = 60 minims.
1 British fluid ounce = 1.732 cubic inch.

Measures of Weight

Avoirdupois or Commercial Weight

1 gross or long ton = 2240 pounds.
1 net or short ton = 2000 pounds.
1 pound = 16 ounces = 7000 grains.
1 ounce = 16 drachms = 437.5 grains.

The following measures for weight are now seldom used in the United States:
1 hundred-weight = 4 quarters = 112 pounds (1 gross or long ton = 20 hundred-weights); 1 quarter = 28 pounds; 1 stone = 14 pounds; 1 quintal = 100 pounds.

Troy Weight, Used for Weighing Gold and Silver

1 pound = 12 ounces = 5760 grains.
1 ounce = 20 pennyweights = 480 grains.
1 pennyweight = 24 grains.
1 carat (used in weighing diamonds) = 3.168 grains.
1 grain Troy = 1 grain avoirdupois = 1 grain apothecaries' weight.

Apothecaries' Weight

1 pound = 12 ounces = 5760 grains.
1 ounce = 8 drachms = 480 grains.
1 drachm = 3 scruples = 60 grains.
1 scruple = 20 grains.

Measures of Pressure

1 pound per square inch = 144 pounds per square foot = 0.068 atmosphere = 2.042 inches of mercury at 62 degrees F. = 27.7 inches of water at 62 degrees F. = 2.31 feet of water at 62 degrees F.
1 atmosphere = 30 inches of mercury at 62 degrees F. = 14.7 pounds per square inch = 2116.3 pounds per square foot = 33.95 feet of water at 62 degrees F.
1 foot of water at 62 degrees F. = 62.355 pounds per square foot = 0.433 pound per square inch.
1 inch of mercury at 62 degrees F. = 1.132 foot of water = 13.58 inches of water = 0.491 pound per square inch.

Miscellaneous

1 great gross = 12 gross = 144 dozen.
1 gross = 12 dozen = 144 units.
1 dozen = 12 units.
1 score = 20 units.
1 quire = 24 sheets.
1 ream = 20 quires = 480 sheets.
1 ream printing paper = 500 sheets

Useful Information

To find the circumference of a circle, multiply the diameter by 3.1416.

To find the diameter of a circle, multiply the circumference by .31831.

To find the area of a circle, multiply the square of the diameter by .7854.

To find the surface of a ball (sphere), multiply the square of the diameter by 3.1416.

To find the side of an equal square, multiply the diameter by .8862.

To find the cubic inches (volume) in a ball, multiply the cube of the diameter by .5236.

Doubling the diameter of a pipe increases its capacity four times.

The radius of a circle × 6.283185 = the circumference.

The square of the diameter of a circle × .7854 = the area.

The square of the circumference of a circle × .07958 = the area.

Half the circumference of a circle × half its diameter = the area.

The circumference of a circle × .159155 = the radius.

The square root of the area of a circle × .56419 = the radius.

The square root of the area of a circle × 1.12838 = the diameter.

A gallon of water (U. S. standard) weighs 8½ pounds and contains 231 cubic inches.

A cubic foot of water contains 7½ gallons, 1728 cubic inches, and weighs 62½ pounds at a temperature of about 39 degrees Fahrenheit. The weight changes slightly above and below this temperature.

To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434.

Steam rising from water at its boiling point (212 degrees F.) has a pressure equal to that of the atmosphere at sea level (14.7 pounds per square inch).

1-GAL. WATER 8.5 × 16 = 136 ozs 8½ lbs = 136 OZS. MEASURE OF WEIGHT

1-GALLON 32 × 4 = 128 ozs qt ~~[illegible]~~ 1 GALLON - 128 OZS. LIQUID MEA

Table of Decimal and Millimeter Equivalents of Fractions of an Inch

ROOT DIA

5-093
6-.100
8-.131
10-140
12-164

Fraction						Decimal	mm.
					1/64	.015625	.397
				1/32		.03125	.794
					3/64	.046875	1.191
			1/16			.0625	1.587
					5/64	.078125	1.984
				3/32		.09375	2.381
				4	7/64	.109375	2.778
		1/8	5			.125	3.175
				6	9/64	.140625	3.572
				5/32		.15625	3.969
					11/64 8	.171875	4.366
			3/16	.10		.1875	4.762
					13/64	.203125	5.159
				12 7/32		.21875	5.556
					15/64	.234375	5.953
	1/4					.250	6.350
					17/64	.265625	6.747
				9/32		.28125	7.144
					19/64	.296875	7.541
			5/16			.3125	7.937
					21/64	.328125	8.334
				11/32		.34375	8.731
					23/64	.359375	9.128
		3/8				.375	9.525
					25/64	.390625	9.922
				13/32		.40625	10.319
					27/64	.421875	10.716
			7/16			.4375	11.113
					29/64	.453125	11.509
				15/32		.46875	11.906
					31/64	.484375	12.303
1/2						.500	12.700
					33/64	.515625	13.097
				17/32		.53125	13.494
					35/64	.546875	13.890
			9/16			.5625	14.287
					37/64	.578125	14.684
				19/32		.59375	15.081
					39/64	.609375	15.478
		5/8				.625	15.875
					41/64	.640625	16.272
				21/32		.65625	16.669
					43/64	.671875	17.065
			11/16			.6875	17.462
					45/64	.703125	17.859
				23/32		.71875	18.256
					47/64	.734375	18.653
	3/4					.750	19.050
					49/64	.765625	19.447
				25/32		.78125	19.844
					51/64	.796875	20.240
			13/16			.8125	20.637
					53/64	.828125	21.034
				27/32		.84375	21.431
					55/64	.859375	21.828
		7/8				.875	22.225
					57/64	.890625	22.622
				29/32		.90625	23.019
					59/64	.921875	23.415
			15/16			.9375	23.812
					61/64	.953125	24.209
				31/32		.96875	24.606
					63/64	.984375	25.003
1						1.0000	25.400

Discount Multipliers

Rate of Discount	10	12½	15	16⅔	17½	20	22½	25	27½	30	32½	33⅓	35	37½	40	42½	45	47½
	.90000	.87500	.85000	.83333	.82500	.80000	.77500	.75000	.72500	.70000	.67500	.66667	.65000	.62500	.60000	.57500	.55000	.52500
And 2½	.87750	.85313	.82875	.81250	.80438	.78000	.75563	.73125	.70688	.68250	.65813	.65000	.63375	.60938	.58500	.56063	.53625	.51188
And 5	.85500	.83125	.80750	.79167	.78375	.76000	.73625	.71250	.68875	.66500	.64125	.63333	.61750	.59375	.57000	.54625	.52250	.49875
5 and 2½	.83363	.81047	.78731	.77188	.76416	.74100	.71784	.69469	.67153	.64838	.62522	.61750	.60206	.57891	.55575	.53259	.50944	.48628
5 and 5	.81225	.78969	.76713	.75208	.74456	.72200	.69944	.67688	.65431	.63175	.60919	.60167	.58663	.56406	.54150	.51894	.49638	.47381
5, 5 and 2½	.79194	.76995	.74795	.73328	.72595	.70395	.68195	.65995	.63796	.61596	.59396	.58663	.57196	.54996	.52796	.50596	.48397	.46197
And 7½	.83250	.80938	.78625	.77083	.76313	.74000	.71688	.69375	.67063	.64750	.62438	.61667	.60125	.57813	.55500	.53188	.50875	.48563
7½ and 2½	.81169	.78914	.76659	.75156	.74405	.72150	.69895	.67641	.65386	.63131	.60877	.60125	.58622	.56367	.54113	.51858	.49603	.47348
7½ and 5	.79088	.76891	.74694	.73229	.72497	.70300	.68103	.65906	.63709	.61513	.59316	.58583	.57119	.54922	.52725		.48331	.46134
7½, 5 and 2½	.77110	.74968	.72826	.71398	.70685	.68543	.66401	.64259	.62117	.59975	.57833	.57119	.55691	.53549	.51407		.47123	.44981
And 10	.81000	.78750	.76500	.75000	.74250	.72000	.69750	.67500	.65250	.63000	.60750	.60000	.58500	.56250	.54000	.51750	.49500	.47250
10 and 2½	.78975	.76781	.74588	.73125	.72394	.70200	.68006	.65813	.63619	.61425	.59231	.58500	.57038	.54844	.52650	.50456	.48263	.46069
10 and 5	.76950	.74813	.72675	.71250	.70538	.68400	.66263	.64125	.61988	.59850	.57713	.57000	.55575	.53438	.51300	.49163	.47025	.44888
10, 5 and 2½	.75026	.72942	.70858	.69469	.68774	.66690	.64606	.62522	.60438	.58354	.56270	.55575	.54186	.52102	.50018	.47933	.45849	.43765
10 and 7½	.74925	.72844	.70763	.69375	.68681	.66600	.64519	.62438	.60356	.58275	.56194	.55500	.54113	.52031	.49950	.47869	.45788	.43706
10, 7½ and 2½	.73052	.71023	.68993	.67641	.66964	.64935	.62906	.60877	.58847	.56818	.54789	.54113	.52760	.50731	.48701		.44643	.42614
10, 7½ and 5	.71179	.69202	.67224	.65906		.63270		.59316	.57339	.55361		.52725	.51407	.49430	.47453		.43498	.41521
10 and 10	.72900	.70875	.68850	.67500	.66825	.64800	.62775	.60750	.58725	.56700	.54675	.54000	.52650	.50625	.48600	.46575	.44550	.42525
10, 10 and 5	.69255	.67331	.65408	.64125		.61560		.57713	.55789	.53865		.51300	.50018	.48094	.46170	.44246	.42323	.40399
10, 10 and 10	.65610	.63788	.61965	.60750		.58320		.54675		.51030		.48600	.47385		.43740		.40095	.38273

Rate of Discount	50	52½	55	57½	60	62½	65	66⅔	67½	70	72½	75	77½	80	82½	85	87½	90
	.50000	.47500	.45000	.42500	.40000	.37500	.35000	.33333	.32500	.30000	.27500	.25000	.22500	.20000	.17500	.15000	.12500	.10000
And 2½	.48750	.46313	.43875	.41438	.39000	.36563	.34125	.32500	.31688	.29250	.26813	.24375	.21938	.19500	.17063	.14625	.12188	.09750
And 5	.47500	.45125	.42750	.40375	.38000	.35625	.33250	.31667	.30875	.28500	.26125	.23750	.21375	.19000	.16625	.14250	.11875	.09500
5 and 2½	.46313	.43997	.41681	.39366	.37050	.34734	.32419	.30875	.30103	.27788	.25472	.23156	.20841	.18525	.16209	.13894	.11578	.09263
5 and 5	.45125	.42869	.40613	.38356	.36100	.33844	.31588	.30083	.29331	.27075	.24819	.22563	.20306	.18050	.15794	.13538	.11281	.09025
5, 5 and 2½	.43997	.41797	.39597	.37397	.35198	.32998	.30798	.29331	.28598	.26398	.24198	.21998	.19799	.17599	.15399	.13199	.10999	.08799
And 7½	.46250	.43938	.41625	.39313	.37000	.34688	.32375	.30833	.30063	.27750	.25438	.23125	.20813	.18500	.16188	.13875	.11563	.09250
7½ and 2½	.45094	.42839	.40584	.38330	.36075	.33820	.31566	.30063	.29311	.27056	.24802	.22547	.20292	.18038	.15783	.13528		.09019
7½ and 5	.43938	.41741	.39544	.37347	.35150	.32953	.30756	.29292	.28559	.26363		.21969	.19772	.17575	.15378	.13181	.10984	.08788
7½, 5 and 2½	.42839		.38555	.36413	.34271	.32129	.29987	.28559		.25703		.21420		.17136		.12852		
And 10	.45000	.42750	.40500	.38250	.36000	.33750	.31500	.30000	.29250	.27000	.24750	.22500	.20250	.18000	.15750	.13500	.11250	.09000
10 and 2½	.43875	.41681	.39488	.37294	.35100	.32906	.30713	.29250	.28519	.26325	.24131	.21938	.19744	.17550	.15356	.13163	.10969	.08775
10 and 5	.42750	.40613	.38475	.36338	.34200	.32063	.29925	.28500	.27788	.25650	.23513	.21375	.19238	.17100	.14963	.12825	.10688	.08550
10, 5 and 2½	.41681	.39597	.37513	.35429	.33345	.31261	.29177	.27788	.27093	.25009	.22925	.20841	.18757	.16673	.14588	.12504	.10420	.08336
10 and 7½	.41625	.39544	.37463	.35381	.33300	.31219	.29138	.27750	.27056	.24975	.22894	.20813	.18731	.16650	.14569	.12488	.10406	.08325
10, 7½ and 2½	.40584	.38555	.36526	.34497	.32468	.30438	.28409	.27056	.26380	.24351	.22321	.20292		.16234	.14205	.12175		.08117
10, 7½ and 5	.39544		.35589		.31635	.29658	.27681		.25703	.23726	.21749	.19772	.17795	.15818	.13840	.11863	.09886	.07909
10 and 10	.40500	.38475	.36450	.34425	.32400	.30375	.28350	.27000	.26325	.24300	.22275	.20250	.18225	.16200	.14175	.12150	.10125	.08100
10, 10 and 5	.38475	.36551	.34628	.32704	.30780	.28856	.26933	.25650	.25009	.23085	.21161	.19238	.17314	.15390	.13466	.11543	.09619	.07695
10, 10 and 10	.36450	.34628	.32805	.30983	.29160	.27338	.25515	.24300	.23693	.21870	.20048	.18225	.16403	.14580	.12758	.10935	.09113	.07290